LITERATURE OF MANUFACTURERS

Catalogues, bulletins and other direct advertising material recently issued.

Manufacturers are requested to send copies of new trade literature promptly to Electric Refrigeration News.

Acorn Opalite

A folder received from the Acorn Opalite Metal Specialties Co., Chicago, Ill., shows its line of restaurant cooling equipment designed for installation with electric refrigeration. A photograph of a ten-foot restaurant fountain with regulation soda equipment and compartments for ice cream, bottle goods, milk, butter, cream and water cooling facilities is contained in the folder. Another illustration shows a restaurant cooler with six compartments. In addition, the construction features of the equipment are also discussed.

American Ice Machine

The American C-10 cooling unit is described in a catalog insert received from the American Ice Machine Co., Los Angeles, Calif. This unit is of one-piece construction and provides a choice of three different temperatures at one time. The upper tray maintains a temperature of about 14 degrees F., the middle tray a temperature of about 20 degrees F., and the lower tray a temperature just below freezing.

Copeland

The new Copeland line is described in a catalog which was distributed by Copeland Products, Inc., Detroit, at its annual convention Feb. 5-6. Five models in the De Luxe line with exterior finishes of vitreous porcelain over Armco iron and food capacities ranging from 6½ cu. ft. to 20½ cu. ft. are shown. Photographs of three models in the CS line in five, seven and nine cubic feet sizes are contained in the catalog. In the N line, three models designed for installation in small homes or apartments are shown. These models have exterior finishes of lacquer and have food capacities ranging from 5 cu. ft. to 7 cu. ft. Two water cooler models are also described. The Copeland line of compressors, cooling units and coils for domestic and commercial installation is also covered.

Dry-Ice

"Dry-Ice" is the title of a book issued by the Dry-Ice Corp. of America, New York, N. Y., which contains a description of the manufacture of this refrigerant and a discussion of its uses in various industries. Several charts show how Dry-Ice refrigeration operates. The use of this refrigerant in "take home" packages of ice cream is also described.

Kalamazoo Vegetable Parchment

A folder received from the Kalamazoo Parchment Co., Kalamazoo, Mich., describes the use of heavy waxed paper in storing foods. Food wrapped in heavy waxed paper, the folder states, retains its moisture and dry foods retain their crispness when so wrapped.

Parker

Three Parker SO² units designed for commercial installations are described in a folder issued by the Parker Ice Machine Co., San Bernardino, Calif. Compressor models equipped with motors ranging in size from 1/3 to 1½ horsepower are shown. All models are automatic in operation and use multi-pass air-cooled condensers.

Pureaire

Folder No. 35c12 prepared by the Parsons Co., Detroit, Mich., contains descriptions of two Pureaire cabinets designed for installation in apartments. Cabinet No. 500 has provisions for a standard apartment size gas range, bread box and three compartments. Cabinet No. 600 is a combination range and refrigerator, space being provided in the compartment below the range for any standard cooling coil. The refrigerator has a food storage capacity of 6½ cu. ft. and 2" insulation throughout.

Tag

Bulletin No. 969 issued by the C. J. Tagliabue Manufacturing Co., Brooklyn, N. Y., announces a new temperature time-operation recorder. This instrument is portable and not only records the temperature, but at the same time will record, in minutes, the running and idling time of the motor, which makes it possible to estimate the power consumption of a refrigerator. In addition a portable recording thermometer and several pocket thermometers are also shown.

Wiremold

A broadside issued by the Wiremold Co., Hartford, Conn., announces a new No. 1000 master size Wiremold conduit and fittings. Photographs show the conduit and fittings and illustrate the method of installing them around beams. A catalog and wiring guide No. 11 presents the Wiremold line and contains helpful suggestions for installation men in regard to conduits and fittings.

New Fountain in Chicago Restaurant Has Refrigerated Luncheonette Service

This fountain was installed in the new Harding Restaurant, 21 S. Wabash Ave., Chicago, by the Bastian-Blessing Co., Chicago. The fountain consists of a marble counter about 30 ft. long with an 8-foot turn at each end and a right angle extension of 6 feet. The counter is rounded at both ends and is constructed of Bois Jordan marble, trimmed with a verd antique marble basing.

The interior equipment consists of a refrigerated luncheonette unit equipped with 10 small salad jars and a double sized salad jar. The second unit consists of two creamers each with capacity of 20 gallons, a 10-gallon milk pump and the usual syrup and crushed fruit equipment. A 3-foot sink drainboard section equipped with refuse chute, tumbler washer, and running water disher, are placed at each end.

REQUESTS FOR INFORMATION

Readers who can assist in furnishing correct answers to inquiries or who can supply additional information are invited to address Electric Refrigeration News, referring to the query number.

Rubber Ice Trays

Query No. 186—A Brooklyn, N. Y., hotel writes, "We are interested in the Copeman ice tray; will you kindly inform us by return mail where they can be bought?"

Note—We suggest that you write G. M. Dwelley, Inc., 235 Curtis Bldg., Detroit, Mich., exclusive distributors for this product.—Editor.

Kerosene Operated Refrigerator

Query No. 187—A firm in Catania, Sicily, seeks the following information, "We will be greatly obliged if you will forward us a list of manufacturers who are at present interested in the development of refrigerator machines for domestic use, using exclusively a small gasoline lamp and not electricity."

Note—The Perfection Stove Co., Cleveland, Ohio, manufactures a refrigerator which is operated by a kerosene burner. —Editor.

Hydrolene Cement

Query No. 188—An electric refrigerator manufacturer inquires, "Can you obtain for us the names of companies who manufacture and put up in small packages, a hydrolene cement, to be used to close the opening in a refrigerator or display case around the tubing after the installation?"

Note—We have been advised that hydrolene cement may be obtained from the Armstrong Cork & Insulating Co., 24th Street and Allegheny River, Pittsburgh, Pa. We understand that this cement is obtainable in small packages suitable for the service and installation man to carry in his kit.—Editor.

Booklets on Refrigeration

Query No. 189—Miss Jean M. Richmond, instructor in foods, Drexel Institute, Philadelphia, Pa., writes, "The New York Edison Co. informs me, in answering my question in a search for information concerning the construction and principles of electric refrigeration, that you published in your magazine, about a year and a half ago, such valuable information. I am most anxious to get such information in a simple definite form, with non-technical wording. I want such information presented in such a way that our Freshmen students can use it. Can you send me a reprint or the references used for the series of articles? Thank you very much for your interest in our work.

Note—The reprints referred to are: "Fundamental Principles of Refrigeration," and "Causes of Food Spoilage." Similar booklets from manufacturers would without doubt be appreciated by Miss Richmond.—Editor.

Tinned Copper Sheets

Query No. 190—A retail music store in Indiana writes, "Will you kindly send a list of sources of supply of tinned copper sheets .028 to .031 in thickness."

Note—We suggest the following concerns from whom we believe you will be able to obtain tinned copper sheets: The American Brass Co., Waterbury, Conn.; Baltimore Brass Co., 1207 Wicomico St., Baltimore, Md.; Chase Brass & Copper Co., Inc., Waterbury, Conn. and the Michigan Copper & Brass Co., 5851 West Jefferson Ave., Detroit, Mich.—Editor.

Book on Ice Cream

Query 191—A public utility company writes: "We should like very much to receive an outline of the contents of the book called 'The Book of Ice Cream,' by W. W. Fisk, mentioned in ELECTRIC REFRIGERATION NEWS. If this has anything to do with freezing ice cream in household types of electric refrigerators, we are very much interested."

Note—The book does not take up specifically the freezing of ice cream in the household electric refrigerator but gives in detail the general principles and the scientific basis for making of ice cream, and is designed especially for the manufacturer.—Editor.

Changes Necessary in Using Different Refrigerant

Query No. 192—A subscriber in Des Moines, Iowa, writes, 'Can you give us the name of any book or magazine giving data on changes necessary in using methyl chloride in an ammonia high side?"

THE CONDENSER

ADVERTISING RATE fifty cents per line (this column only).

SPECIAL RATE if paid in advance—Positions Wanted—fifty words or less, one insertion $2.00, additional words four cents each. Three insertions $5.00, additional words ten cents each. All other classifications—fifty words or less, one insertion $3.00, additional words six cents each. Three insertions $8.00, additional words sixteen cents each.

POSITIONS AVAILABLE

REFRIGERATOR CABINET SALESMEN WANTED by a concern of thirty years' repute, high rating and of national reputation. Following an expansion sales policy, new territory available. Must be able to earn $5,000.00 or more per annum, must also furnish bond. Applicants who can meet our requirements will be given a personal interview. When writing please state in full all your qualifications, personal and general. Box No. 139.

POSITIONS WANTED

POSITION WANTED. Sales engineer with seven years' experience selling electric refrigeration, three years with Frigidaire and four with Kelvinator. Would like to correspond with jobber or manufacturer doing export business with Latin American countries, as I speak Spanish fluently. Thoroughly familiar with commercial installation as well as domestic. Address Box No. 144.

GENERAL MANAGER. Very broad and successful experience in manufacturing, finance, engineering and sales, with large and prominent Detroit Corporations during past 15 years. Especially skilled in organization, increasing production and building sales. Now connected in similar capacity in refrigeration industry. Address Box No. 146.

SALES ENGINEER; available March 1st. Fifteen years' large corporation experience. Well acquainted with domestic, commercial, oil burner and industrial trade in Detroit and Michigan Districts. Highest references given from executives above industries and former employer. Prefer connection with manufacturer of refrigeration equipment. Experienced in selling controls, liquid control valves, and evaporators. Have had experience enough in domestic refrigeration for connection with manufacturing company. Able to organize and direct sales organization. In view of acquaintance and large following in the above industries in this territory, prefer Detroit and Michigan districts. Address Box No. 145.

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ELECTRIC REFRIGERATION NEWS

The business newspaper of the refrigeration industry

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ELECTRIC COOLING IS TAKEN FOR GRANTED IN THE MODERN HOME

Has Prominent Place in Displays At Detroit Builders' Show

THE place of electric refrigeration in the modern home is left undoubted at the Eleventh Annual Builders' Convention being held Feb. 20 to Mar. 2 at Convention Hall, Detroit, Mich.

Distributors of different makes of refrigerators have unusually attractive displays and refrigerators appear in model homes, model kitchens; and displays of kitchen equipment include electric refrigerators. The reproduction of Washington's Mt. Vernon home alone stands without a refrigerator.

The model home which will be given away in a drawing the last day of the show is Copeland equipped.

Norge Detroit Sales Co., 2567 W. Grand Blvd., display ten models, including models of the 1929 De Luxe line. These are shown in all-porcelain, white, and grey and white finish, with de luxe hardware and quiet motor. An open unit is exhibited running. A sign made of frost covered coil, run on a model 320 unit, gives the name of the company.

Strelinger-Copeland Sales Co., 4490 Cass Ave., are exhibiting the new line of Copeland units which was recently introduced. Some commercial units are displayed, but the all-porcelain cabinets with interchangeable colored tops, light inside the box, and silent compressor is featured. One rubber tray is standard equipment on all models.

The Diamond Tool and Engineering Co., 548 E. Fort St., Detroit, are showing the Econom-Ice refrigerator. The compression type unit, using methyl chloride as refrigerant, which handles up to a 12 cu. ft. box, is on display. Two refrigerators, one porcelain and one lacquer finish, are shown.

Rice Tuck Refrigeration, Inc., 10220 Plymouth Rd., are introducing the Rice Products Corp. quiet condensing unit installed on top of refrigerator cabinet under a hood. This model is porcelain lined and furnishes 30 ice cubes. Commercial and apartment house models and two water coolers are in the exhibit.

Electric Utilities Corp., 3098 E. Grand Blvd., are showing six models of General Electric refrigerators. All models are in white and range of domestic sizes are

(Concluded on Page 4, Column 2)

COPELAND FACTORY SCHEDULE INCREASED

Copeland Products, Inc., has increased its March production schedule considerably to meet orders already on the books, according to an announcement by W. D. McElhinny, vice-president in charge of sales. Production was speeded up 40 per cent over that of a year ago and following the introduction of the company's new line it was speeded up another 20 per cent more, according to factory officials.

Mr. McElhinny and the company's zone managers are to start about the first of March on a sales tour of the entire country, conducting sales conventions in every large city. Copeland's sales outlets are being increased rapidly and an increase of at least 50 per cent over the volume for 1928 is predicted for 1929.

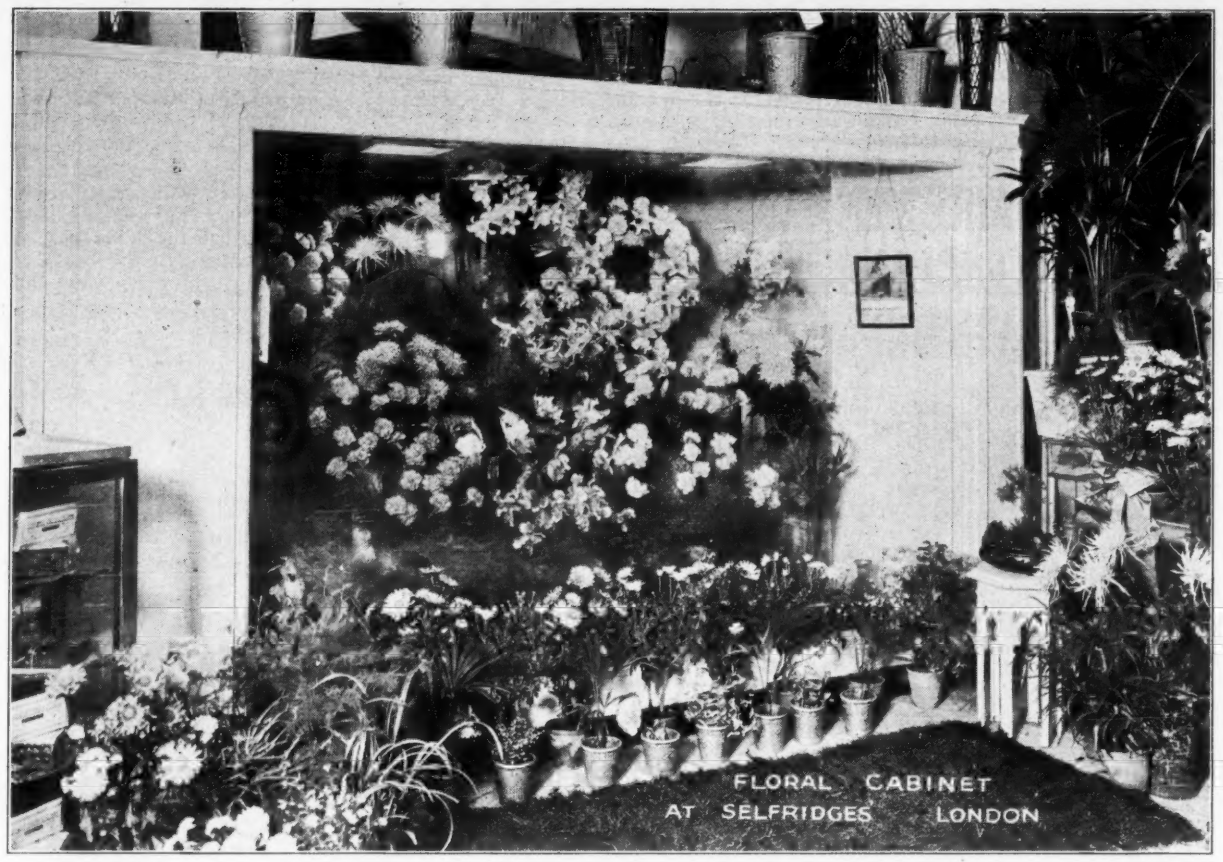
"Electric refrigeration prospects for 1929," said Mr. McElhinny, "are the brightest they have ever been. According to a survey approximately $8,500,000,000 will be expended for new construction and for repairs and replacements in the building field during 1929. This is an increase of $500,000,000 over 1928. All of this means more electric refrigeration, for few apartment houses are being built today without provision for electric refrigeration.

"Negotiations have been completed recently with one of the country's largest and best known oil companies to place water coolers in the company's oil stations all over the entire United States. The Copeland factory was placed on a day and night schedule on Feb. 11."

WESTINGHOUSE FORMS REFRIGERATION DEPT.

The Westinghouse Electric & Manufacturing Co. announces the organization of an electric refrigeration department with headquarters at the Mansfield, Ohio, works. J. S. Tritle has been appointed general manager and Carl D. Taylor, formerly manager of the industrial division of the company's Pittsburgh office, has been appointed manager of the refrigeration department by Mr. Tritle.

London Admires its First Electrically Cooled Florist Refrigerator Installed at Selfridge's



Selfridge's in London, England, were first in the city to preserve their flowers with electric refrigeration. Frigidaire made the installation in the commissary which is separate from the new department store.

FRIGIDAIRE MEN TURN IN $7,000,000 ORDERS AT REGIONAL MEETS

Awards Totaling $45,000 Made To Quota Men of Each District

OFFICIALS of the Frigidaire Corp. returned to Dayton on Feb. 23, after completing a convention swing of 10,000 miles, which began in Atlanta on Jan. 31 and closed in New York City last week. Orders for more than $7,000,000 worth of business were turned in by Frigidaire salesmen, it is reported.

The trip taken by the officials was the most extensive one ever conducted by Frigidaire Corp. It was more elaborate, covered a wider range of territory, and brought the Dayton officials into contact with more men in the field. One of the features of the convention was the announcement of the new Frigidaire products. The cold control for domestic models, room cooler, and additions and improvements in the various lines were enthusiastically received.

The quota men of each district were honored and presented with $100 in gold for their sales efforts during the year. In this way more than $45,000 was distributed during the convention journey.

J. A. Harlan, sales manager and permanent convention chairman, regards the 1929 outlook as being very promising. "Contact with business leaders," he said, "in every branch of industry and observation of conditions in cities through the country revealed that this year will be one of the most prosperous ever experienced. The receptions given the new product by the 8,000 Frigidaire dealers and salesmen leaves us with no doubt that Frigidaire will enjoy a very successful year."

The conventions at Atlanta, Memphis, Kansas City, Chicago, Boston and New York were addressed by E. G. Biechler, president and general manager of Frigidaire Corp. Included in the convention party were:

T. B. Fordham, works manager; R. F. Callaway, in charge of branch operations; L. S. Geilholtz, chief engineer; J. E. Houser, chief inspector; E. D. Doty, advertising manager; R. L. Lee, head of sales promotion department; H. F. Lehman, installation and service manager; S. A. Long, Frigidaire distributor at Wichita; G. E. Durban; O. C. Callison, traffic manager; H. H. Kennedy, zone manager; J. J. Nance, head of provincial sales promotion; A. D. Farrell, stage manager; C. T. Mutchner, of the Geyer Co.; G. A. Ames, manager Frigidaire division, General Motors Acceptance Corp.; Verna "Dusty" Miller, Therese Schneble, R. B. Ambrose, A. J. Harrison, C. E. Quigley, Sam Smoot, Paul Bunger, Insco Williams, J. B. Nahstall and J. C. Coffey.

The Canadian convention was held at Montreal on Feb. 14-15, and a special party under the direction of L. C. Shan-

(Concluded on Page 2, Column 2)

By Dorothy Dignam, European Correspondent

HARRY GORDON SELFRIDGE, pioneer American merchant in England and noted for his enterprising business methods, has purchased the first electrically cooled floral refrigerator to appear in London.

The installation was made by Frigidaire, Ltd., in the Selfridge commissary store, which is separate from the large new Selfridge department store and deals only in food products and flowers. This shop is located in Oxford street, across from the department store, and is daily passed by thousands of feminine shoppers. Selfridge's specialize in flowers and plants for the home and artistic table centerpieces.

The electric cooling of floral cabinets has been somewhat slow in the British Isles because of several factors.

Flowers grow here as nowhere else in the world, due largely it is said, to the perpetual moisture in the atmosphere. For the same reason, plants and cut flowers in this cool climate do not require refrigeration as in warmer climes.

Also the floral business here is more definitely in the luxury class than in America, catering to the gift trade especially. Flowers for the masses are sold at the curb and in the colorful "petal markets" which surround every busy corner. Even in wintertime, it is not necessary to seek a flower store.

However, the florist, as contrasted with the mere peddler, stocks the more delicate and perishable blooms and therefore is in great need of proper refrigeration as an economic measure. This fact, it is believed, and the growing pride among merchants in general as to the equipment of their stores, will help to increase electric refrigeration installations in British flower shops.

KELVINATOR CLOSES SUCCESSFUL SERIES OF SALES MEETINGS

KELVINATOR regional sales conventions for this year were brought to a successful close today with the final meeting at Denver, Colo., in charge of W. B. Milliken. Twenty-one meetings were held in various cities throughout the country, the series opening with the Detroit convention on Feb. 8. At this meeting, the new Kelvinator line was announced. Large attendances have been reported at all the conventions and orders for the new models turned in indicate that the new line is being well received.

A single program was arranged for the entire series of conventions, each meeting lasting a full day and followed by a banquet in the evening.

The morning session was devoted to the domestic line. Opening the convention the Kelvinator district manager introduced the first speaker from the home office, delivered the keynote address and introduced the personnel of Kelvinator

(Concluded on Page 2, Column 1)

TWO DAY CONFERENCE OF G. E. DISTRIBUTORS HELD IN CLEVELAND

175 Hear Factory Heads Talk In Elaborate Business Program

APPROXIMATELY 175 General Electric refrigerator distributors, members of distributing organizations and General Electric officials attended a two day conference at the Little Theatre of the Public Auditorium at Cleveland, Feb. 20-21. The conference was of two day duration and an elaborate program of business and entertainment was presented.

C. E. Eveleth, vice president of the General Electric Company addressed the group and told them of the improvements that have been made in the production methods of the Schenectady factory. Research development was discussed by C. Dantsizen of the research laboratories.

W. S. Goll, manager, and H. A. Whitesel, engineer of the Ft. Wayne factory of the General Electric Co., talked on the development of commercial refrigeration units.

C. H. Steenstrup, engineer of the refrigeration development department, Schenectady, who with other engineers and research experts were responsible for the development of the hermetically sealed General Electric refrigeration unit, dwelled briefly on the effort and research necessary in producing the water cooler.

Cleveland officials and division heads who addressed the distributors are:

T. K. Quinn, general manager; P. B. Zimmerman, general sales manager; L. R. Edwards, advertising manager; A. C. Mayer, merchandising service manager; W. J. Daily, sales promotion manager; J. J. Donovan, apartment house division manager; H. H. Bosworth, central station division manager; W. E. Landmesser, commercial division manager; H. P. Smith, auditor; M. F. Mahony, special sales representative. These men are all from the main office of the General Electric Refrigeration Department.

Henry Edson, vice president of the General Contract Purchase Corporation, spoke to the group on Finance Plans and how to conduct them.

A $15,000 collection of original paintings was exhibited and presented as rewards to distributors. These paintings are the work of such artists as Saul Tepper, Frank Bensing and Arthur Litle and are valued from $600.00 to $1,400.00 each.

Distributors attending this conference came from all corners of the United States. George H. Belsey, former vice president of Fuller and Smith, Cleveland advertising agency and now General Electric refrigerator distributor in Los Angeles, along with George Bauder, San Diego and L. H. Bennett, San Francisco, representing the far west; George Patterson, St. Petersburg, Florida; Rex Cole, New York City and E. O. Cone, El Paso,

(Concluded on Page 4, Column 3)

COMMITTEE SUBMITS TEMPERATURE SCALE FOR REFRIGERATORS

Commercial Box and Machine Makers Assert Present Usage Is Economical

REPORTING for a Conference Committee of the Commercial Refrigerator Manufacturers at the meeting of the association held in Detroit Jan. 21 and 22 (see ELECTRIC REFRIGERATION NEWS, Jan. 30 issue), R. E. Ottenheimer, chairman, announced that arrangements had been completed for a permanent body to be known as the Joint Commercial Refrigeration Committee representing the Commercial Refrigerator Manufacturers and the Refrigerating Machinery Manufacturers' Association with A. H. Baer, of Waynesboro, Pa., as chairman. Important among the activities of the conference committee under the chairmanship of Mr. Ottenheimer has been the development of a scale of recommended temperatures for commercial refrigera-

An explanation of the recommended temperatures for commercial refrigerators and coolers is presented on page 10 of this issue.

tors and coolers adopted by the Commercial Refrigerator Manufacturers at its meeting in October, 1928, and also adopted by the Refrigerating Machinery Manufacturers' Association.

In reviewing the committee's work at the recent meeting in Detroit, Mr. Ottenheimer summarized the conditions which have made it necessary to draw up recommended temperatures for various types of commercial applications and to seek the approval of other associations' boards and committees interested in commercial refrigeration.

Following is the resolution adopted by the association which has just been released for publication:

Grand Rapids, Mich.,
January 7, 1929.

Recommendation as to the most practical temperatures to be carried in commercial refrigerators and cooling rooms, when cooled with mechanical refrigeration.

The Joint Commercial Refrigeration Committee has prepared the following recommendation as to the most practical temperatures for use in commercial refrigerator equipment. This recommenda-

(Concluded on Page 10, Column 1)

HALTERMAN HEADS CHICAGO A. S. R. E.

H. R. Halterman was elected president of the Chicago section of the American Society of Refrigerating Engineers at its regular meeting which was held at the Chicago Engineers' Club on Feb. 19. O. A. Anderson was elected vice president and B. E. Seamon, secretary and treasurer. A. J. Authenrieth, retiring president, opened the meeting and commented on the success of Power Conference which was held in Chicago from Feb. 12-18. Two papers were read at the conference on refrigeration.

President Halterman, following his speech of acceptance, opened the technical session of the meeting at which two papers were read. The first entitled, "Refrigeration and Ventilation as Aids to National Efficiency" prepared by S. C. Bloom was presented by B. E. Seamon. The other paper was read by A. J. Authenrieth on the "Application of Refrigeration to Preservation of Foods." Attention was given to cold storage, packing houses and transit in this paper.

On Jan. 16, the Chicago section held a joint session with the National Association of Practical Refrigerating Engineers in the auditorium of the Engineering Bldg. President A. J. Authenrieth presided as chairman at this meeting which was attended by 275 members. Accident prevention was the chief subject discussed at the meeting and interesting talks were given by the following: Wesley Oler, Jr., of the American Ice Co.; W. D. Keefer, chief engineer of the National Safety Council and A. J. Authenrieth.

SERVEL GETS $50,000 GOVERNMENT CONTRACT

Servel, Inc., Evansville, Ind., announces that it has been awarded a contract by the government for installing complete refrigerating systems at various army posts.

This contract, which totals $50,000, includes 250 refrigerating systems and cabinets. Work on this contract is to be started immediately.

Reports of Regional Meetings

DENVER KELVINATOR CONVENTION CLOSES SERIES OF MEETINGS

(Continued from page 1, column 3)

Corporation with the aid of a movie which showed each of the department heads and told briefly of the duties of each. The opening address was followed by talks on the refrigeration market, Kelvinator quality and new manufacturing methods, the utilities department, the service department, the cabinet division and the new domestic line.

The afternoon session featured a showing of the new commercial line. A talk on Redisco, Kelvinator's financing company which takes over the burden of the deferred payments from the dealers, was included. The new commercial line was introduced by a representative of the commercial department. "Serving the Dealer" was the title of a talk by the district manager. The advertising and sales promotion plans were given considerable attention by a representative of Kelvinator Corp.

Executives who addressed sessions

Representatives from the Corporation attending the various conventions included Geo. W. Mason, president and general manager; H. W. Burritt, vice president in charge of sales; H. A. Sieck, vice president in charge of commercial sales; J. S. Sayre, domestic sales manager; J. A. Corcoran, director of advertising and sales promotion; J. M. Fernald, commercial sales manager, E. A. Seibert, director of service; R. E. Densmore and H. G. Dakin representing the sales department; Theodore Slade, manager of the Utilities Department and H. A. D'arcy, of that department; Messrs. Flynn, Johnson, Loman, Silliman, Mitchell, Bierhaus and Brandon, Kelvinator commercial representatives; Messrs. Petrie, Gibson, Myers, Brasier of Redicco; Messrs. Yinkey, Hofsoos, Haig, and Perrine, representatives of McManus, Incorporated, Kelvinators' advertising counsel.

District managers in charge

Kelvinator District Managers in charge of the various regional conventions were: Chicago, Feb. 11, F. J. Foersterling; St. Louis, Feb. 11, L. W. Shadburne; New York, Feb. 11, N. S. Gotshall; Boston, Feb. 12, H. Troutwine; Minneapolis, Feb. 13, H. A. Dahl; Oklahoma City, Feb. 13, J. S. Cortines; Los Angeles, Feb. 13, Wm. E. Day; Charlotte, N. C., Feb. 13, F. P. Hallock; Fort Worth, Feb. 13, J. S. Cortines; Omaha, Feb. 15, F. H. Sperry; Jacksonville, Fla., Feb. 15, F. P. Hallock; Baltimore, Feb. 15, Campbell Wood; San Francisco, Feb. 16; Wm. E. Day; Kansas City, Feb. 18, L. W. Shadburne; Houston, Feb. 18, J. S. Cortines; Pittsburgh, Feb. 19, H. E. Markland; Seattle, Feb. 20, T. S Edwards; Salt Lake City, Feb. 25, Wm. E. Day; Denver, Colo., Feb. 27, W. B. Milliken.

KELVINATOR MEN VIEW NEW MODEL AT OMAHA REGIONAL CONVENTION

Three hundred and fifty dealers, distributors and salesmen from five states attended the Kelvinator district convention held in Omaha on Feb. 14. H. D. Dakin, director of distribution at Detroit, presided. S. A. Silliman and Harry Sieck, Detroit, were present and addressed the meeting. L. W. Shadburne of St. Louis, and A. M. McLennon of Kansas City, were also present. Local men participating on the program were J. E. Davidson, president and general manager of the Nebraska Power Co., agents of the Kelvinator for Omaha territory; and A. J. Cole, general manager of the McGraw Electric Co., district distributors for this territory, and H. R. Edwards, manager of the refrigeration department of the McGraw Electric Co.

The new Kelvinator was shown the visiting delegates and it received much attention and praise. The meeting ended with a dinner at the Hotel Fontenelle in the evening.

500 DISTRIBUTORS AND DEALERS ATTEND BOSTON KELVINATOR CONVENTION

More than 500 delegates assembled at the Kelvinator regional sales convention at Hotel Kenmore, Boston, Feb. 12. H. Troutwine, New England district manager was in charge of the meeting. He stated that during the past four months, the total Kelvinator business in Greater Boston area has been equivalent to the total business of the entire year twelve months ago.

George W. Mason, Kelvinator's president and general manager, outlined the future for Kelvinator and said—'the most unusual winter ever known in the electric refrigeration industry gives promise of a spring exceeding our fondest hopes."

Other speakers at this convention were Henry D'arcy, Kelvinator utilities representative; Richard Fassuacht, Leonard Division, Grand Rapids; Alvin P. Smith, Boston service manager; Lyle Huntoon, Kelvinator Corp., C. M. Armstrong, ReDisCo vice president and general manager, financing Kelvinator dealer's sales; Arden Yinkey, representing McManus Inc.; Phil Johnson and Lester Langley, New England district representatives.

1,000 FRIGIDAIRE MEN ATTEND NEW ENGLAND REGIONAL GATHERING

Frigidaire dealers and salesmen in New England territory attended a regional sales convention which was held at the Copley-Plaza Hotel in Boston, Mass., on Feb. 20. It is estimated that about 1,000 representatives were present at the meeting.

Twenty officials from the Dayton office, headed by E. G. Biechler, president and general manager of Frigidaire Corp., and J. A. Harlan, sales manager and permanent convention chairman, attended the meeting. Other officials in the party were: L. E. Keilholtz, chief engineer; R. F. Calloway, manager of branches, and E. D. Doty, advertising manager.

Sales and advertising plans for the year were discussed at the morning session, which was followed by a luncheon at noon and a banquet in the evening, with a program of cabaret entertainment. These entertainers have been featured at all the regional conventions this year. They have traveled with the company and the party has its own baggage cars which carry 15 tons of scenery and equipment.

DAYTON SENDS LARGE PARTY TO CLEVELAND FRIGIDAIRE CONVENTION

Seven railroad passenger cars were used to transport the Dayton delegation to the Frigidaire regional convention which was held at the Ohio theater in Cleveland, Ohio, on Feb. 15. H. J. Walker, Frigidaire branch manager, headed the Dayton party which left Thursday evening following a pep meeting which was held at the Dayton sales branch.

J. A. Harlan, sales manager and permanent convention chairman, presided at the Cleveland meeting. The new products recently announced by the Frigidaire Corp. were viewed for the first time by the many salesmen, dealers and distributors attending the convention. A meeting of branch managers and dealers was held in Cleveland on Feb. 14.

FRIGIDAIRE MEN TURN IN $7,000,000 ORDERS AT REGIONAL MEETINGS

(Concluded from page 1, Column 2)

non, manager of the foreign department, conducted this meeting. E. A. Lowden, Canadian manager, will conduct meetings at Calgary and Vancouver. In the group that visited Montreal were:

E. N. Madden, assistant foreign manager; H. R. Coate, foreign advertising manager; W. G. Kinder, foreign department; S. Wise, foreign advertising department; Miss A. A. Flynn, foreign advertising department; D. W. Van Patten, foreign engineering department; R. J. Thompson, foreign engineering department; Miss A. Little, foreign engineering department; Eugene Moore, sales education department; W. J. Sandstrom, and Don Merrill.

The regional sales convention for this year will close with the western convention, which will be held in San Francisco on March 15. Officials from the Dayton plant who visited the other cities in this country will make this trip, which will be made by the way of the Grand Canyon, where a day's stop-over has been arranged.

O. E. Crites and A. M. Briggs Join Staff of Arch Electric Co.

Arch Electric Co., Inc., Portland, Oregon, distributors of General Electric refrigerators, has appointed Orr E. Crites as wholesale sales manager. Mr. Crites has been with the Ice Maid refrigerator division of the Great Western Appliance Co., Kansas City.

Arthur M. Briggs has been appointed advertising and sales promotion manager. He was formerly in the advertising department of both the *Oregonian* and *Oregon Journal*.

100 ATTEND KELVINATOR REGIONAL CONVENTION IN FORT WORTH, ON FEB. 15

More than a hundred Texas dealers and distributors for Kelvinator Corp., met in Fort Worth, Feb. 15 in one of the series of regional conventions being held by the company. The new quiet condensing unit was introduced and the 1929 advertising program outlined.

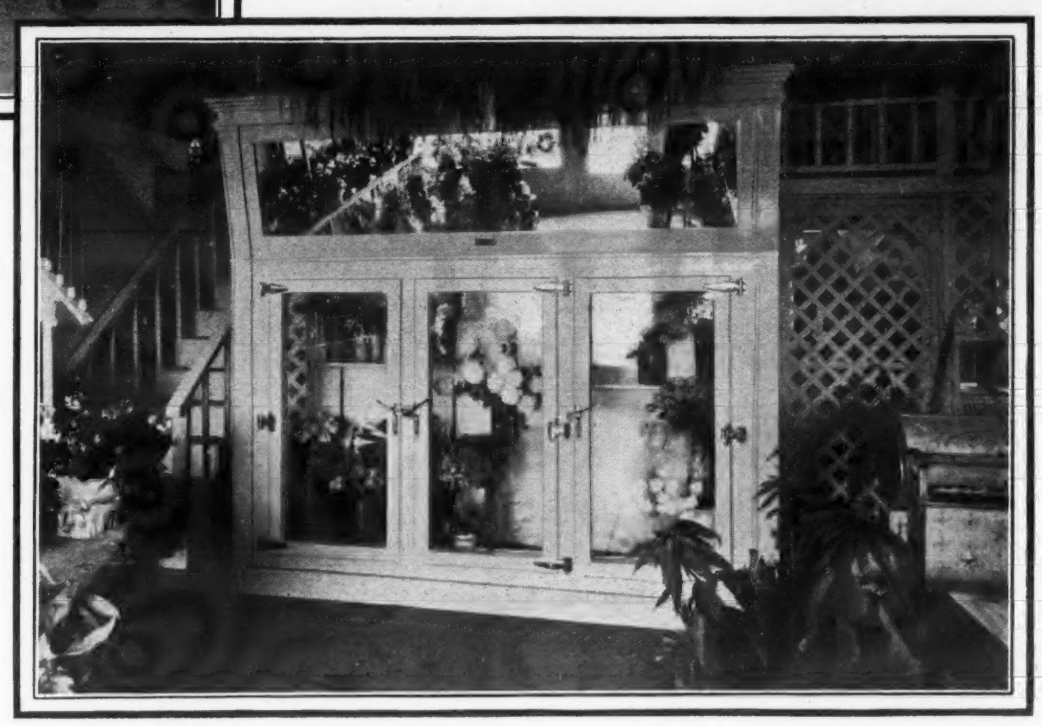
Speakers at the meeting included J. S. Cortines, district manager; J. A. Corcoran, Detroit, director of advertising and sales promotion; Danner Bierhaus, Detroit, assistant commercial manager; S. E. Meyers, Detroit; Lyman Savage, Detroit, technical instructor; and Herbert W. Browne, Fort Worth, manager of the Kelvinator division of the Nash Hardware Co.

PORTLAND KELVINATOR MEN AT SEATTLE MEET

C. C. Crawford, in charge of Kelvinator sales of the Portland Electric Power Co., attended the meeting of Kelvinator dealers of Oregon and Washington, at Seattle, Feb. 20. Following that meeting, Mr. Crawford went to Vancouver, B. C., to attend the Northwest Association of Ice Industries convention. Others from Portland who attended the Vancouver convention were: A. G. Riedell, Tom Clow, and Richard Quinney, the Liberty Coal & Ice Co., and W. H. Holman, the Ice Delivery Co.

Bopp's Flower Shop, Cumberland, Maryland. A McCray Florist Refrigerator enhances the attractive interior of this shop and keeps flowers fresh in display.

Thomas Floral Company, Dallas, Texas. One of the finest floral houses in the southwest. McCray refrigeration keeps stock always fresh and draws trade.



McCRAY Adds *Efficiency to Beauty*

and Helps FLORISTS to Make *More* Money

BEAUTY is the florist's stock in trade. Protecting the fragile beauty of his cut flowers and presenting them to his trade in an atmosphere of refinement and distinction is the first requirement of profit in the florist's business.

McCray fulfills both of the requirements. The efficient, economical cooling system in every McCray refrigerator maintains the correct temperature to preserve the freshness and beauty of cut flowers with a minimum of loss through spoilage.

The design of McCray florist refrigerators enables fine display of the stock and the finish can be made to harmonize with the interior of the finest stores. Stock tastes and the built-to-order models are available to meet every florist's needs.

Mechanical refrigeration of any type may be used in McCray florist refrigerators, as in all other McCray models. This is of exceptional importance to dealers in electrical refrigeration, because it insures maximum efficiency of the refrigerating unit at a minimum cost for operation, and hence a *satisfied customer.*

Pure corkboard insulation sealed with hydrolene cement is used in all McCray models. Cooling unit may be installed in any model without change. Forty years' experience in building refrigerators of the highest grade is embodied in every McCray.

Dealers in electric refrigeration are invited to get all facts about the McCray line—refrigerators for all purposes.

Mueller Floral Co., Wichita, Kansas. With handsome McCray equipment which customers note, this shop is making more money.

McCRAY
REFRIGERATORS
FOR ALL PURPOSES
For
Grocery Stores·
Meat Markets·
Hotels · Restaurants · Hospitals·
Institutions··
Florist Shops·
Homes · · · ·

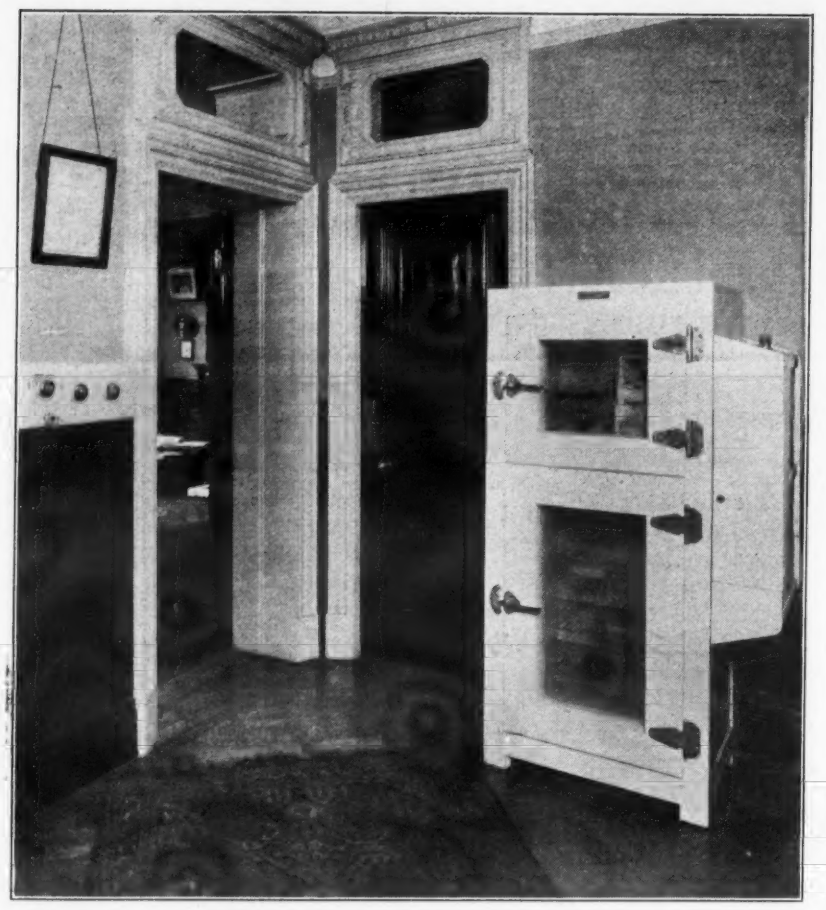
McCRAY
REFRIGERATOR SALES CORPORATION
Dept. 66, Kendallville, Ind.
Salesrooms in All Principal Cities *(See Telephone Directory)*

WORLD'S LARGEST MANUFACTURER OF REFRIGERATORS FOR ALL PURPOSES

McCRAY REFRIGERATORS

London Rental Agent Displays a Glass Front Electrolux in Office

Prospective English Tenants Impressed by Modern Equipment in Apartments



By Dorothy Dignam, European Correspondent

So important a renting feature is the gas operated Electrolux in the apartments managed by Western Mansions, Ltd., of London, England, that the agent, T. J. Cullen, has had a special glass-door model installed in the reception room of his office.

This refrigerator is the first thing the prospective tenant views as he enters the renting office and being so wholly unexpected a sight it never fails to attract interest. The machine is in constant operation and the shelves are decorated with appetizing foods.

More than two hundred gas refrigerators have been placed in the three buildings controlled by Western Mansions, Ltd. These apartments were built some time before the war but have recently been modernized with tiled baths and kitchens, gas heaters in all fireplace openings, enameled gas ranges and the Electrolux refrigerators. Tenants have the privilege of choosing from three sizes of refrigerator and each machine is complete in itself. For the use of the refrigerator the tenant pays a small additional sum on his monthly rental. This amount runs from approximately $2.30 a month for the Baby model to $3.75 a month on the large Household model. Figuring these small monthly amounts over a period of five years—a five-year lease being almost the minimum for a good apartment in London—the refrigerator at a wholesale price to the building management is virtually paid for by the tenant. Also the tenant in this particular group of apartments pays his own gas bill, including, of course, the cost of operating the refrigerator.

When the prospective renter inquires about the gas consumption—as it is quite natural he should do—he is shown actual figures kept on the display model down in the agent's reception room. These figures are quite modest in London, estimated at 6c to 8c per day. In the area served by one gas company at a uniform rate to all, there are likely to be a dozen or more electric companies with rates varying from two cents to sixteen cents per kilowatt hour. This is an advantage in equipping a scattered group of apartment buildings with gas refrigeration.

There is more modernizing of old buildings than erection of entirely new buildings in England at the present time, and the refrigeration industry is keen on the track of this opportunity for business. In London itself, however, some very elaborate new apartment hotels are going up and one of the latest to be completed is Grosvenor House in Park Lane, Mayfair, just across the park from Buckingham Palace.

14 Refrigerators in One Kitchen

Here the suites are arranged with and without private kitchenettes and one large kitchen is equipped for the preparation of meals which may be served in one's apartment or in the very smart cafe. This kitchen is equipped with Electrolux gas refrigerators in fourteen separate units, each complete with compressor and condenser. One refrigerator is exclusively for wines, another for meat, another for milk and cream, etc.

This practice of installing a number of separate units instead of one large cooling room is discovered quite often in England. The separate refrigerators can be placed convenient to the various working centers—the pastry chef having his own unit for instance, the service pantry another unit, etc. There is less intake of warm air because there is no large central refrigerator for all the staff to constantly open and close. And if a breakdown occurs in one machine, food may be transferred immediately to another and no loss of time or supplies incurred.

ELECTRIC COOLING IS TAKEN FOR GRANTED IN THE MODERN HOME

(Concluded from page 1, column 1)

displayed. The portable model, suitable for hospital or restaurant use, is shown.

Two Electrolux models are on display in the booth of the Detroit City Gas Co. One is in gray finish and one in green.

The W. L. S. refrigerator, which has recently been offered for sale in the stores of Sears, Roebuck & Co., is on display in the company's booth. Two refrigerators, both porcelain lined, of plug-in type are displayed.

Dalrymple-Kelvinator Co., 2842 W. Grand Blvd., are displaying ten models showing the new all-porcelain cabinets with capacity up to 8 cu. ft. Increased number of cubes per box size, new quiet compressor unit, new hardware, rubber tray as standard equipment, and Pyrex defrosting pan are exhibited as new features.

General Necessities Corp. is featuring the 4.4 cu. ft. Absopure model. It is shown in duco finish inside and out, all-porcelain, and porcelain exterior. Nine models are on display. The duplex model for apartment house installation is exhibited installed with the unit operating the two boxes. The model provides 3.7 cu. ft. The model displayed is finished in Nile green.

Universal Cooler Corp., 18th and Howard Sts., Detroit, are exhibiting ten refrigerators, two water coolers, a walk-in type cooler, and a portable self-contained display counter. Commercial and domestic models are included. A multiple installation is in operation. The Windsor factory of the company is represented.

Frigidaire Sales Corp., General Motors Bldg., display 25 models all equipped with the new cold control. Apartment house, domestic, and commercial models are shown. Use of cold control equipment in self-contained and remote installations is demonstrated.

COPELAND ARRANGES FOR FINANCING DEALER SALES

Copeland Products, Inc., Detroit, have closed a contract with the Commercial Credit Co. of Baltimore, Md., which provides financing plans for all the branches of Copeland sales; domestic, retail, wholesale, apartments and commercial.

This contract will enable 2,000 Copeland dealers to sell electric refrigerators on down payments as low as 15 per cent, with 18 months for the balance.

TWO DAY CONFERENCE OF G. E. DISTRIBUTORS HELD IN CLEVELAND

(Concluded from page 1, column 4)

Texas, were a few of the distributors who travelled long and far to attend the meeting.

P. B. Zimmerman, general sales manager of the General Electric Refrigeration Department, stated that because of the size of the General Electric organization, a series of regional conferences were held last fall in the key cities of the United States for the distributors and their dealers.

"This conference," Mr. Zimmerman said, "was for the distributors themselves. Plans were presented for the biggest selling season the General Electric Company has experienced. Various models were on exhibit and selling methods were conveyed in the form of interesting playlets put on by skillful actors."

Luncheon on both days was served at the Hollenden hotel and a banquet in the Georgian room of the Cleveland hotel was held on Wednesday evening, Feb. 20.

Aside from the big four-day conference held at Association Island last September, this meeting is probably the biggest and most important General Electric refrigerator meeting yet held.

100 COPELAND DEALERS ATTEND CONVENTION IN NEW YORK ON FEB. 20

About 100 Copeland dealers in New York state attended a convention which was held by the Copeland Refrigeration Co. of New York at the Pennsylvania Hotel in New York City on Feb. 20. At this time the 1929 Copeland line was shown to the many visiting dealers and salesmen.

BANISHING *the* BUGABOO *of Profit-Killing Service*

MOVING parts . . . none. Machinery . . . none. Noise . . . none. Three simple facts. Yet they explain why the gas refrigerator cuts out that costly nuisance . . . service after installation.

When the Electrolux dealer makes a sale, he gets his just, earned profit. He doesn't worry about later servicing that cuts original profit to shreds. For the Electrolux unit never needs service . . . never needs mechanical adjustment.

There are no mechanical parts to get out of order or wear out. The Electrolux substitutes for complex machine action simple physical action . . . the heat of a tiny gas flame.

The unit is a sealed system of chambers and tubes, in one metal piece, hermetically welded at the factory. It has, of course, the automatic controls that permit its regulation to individual conditions. Such simple regulation and occasional cleaning of the gas burner are the only things about it that even remotely resemble customary refrigerator service.

Add to this, that the Electrolux is absolutely noiseless . . . its first cost to your prospective customer is no greater . . . its operating cost, owing to the low price of gas and small consumption, is far less . . . and you see why profitable Electrolux franchises are so much sought after by progressive refrigeration dealers.

WHERE FRANCHISE IS OPEN

In certain territories, Electrolux dealer franchises are open at present. If you are interested in taking on this full-profit, no-service line, write or wire today to Servel Sales, Evansville, Indiana.

The STORY OF HEAT *that* FREEZES

Advertised by 4,500,000 color pages every month . . . chosen by builders of finest modern apartment houses . . . made in complete line of eight handsome, lifetime cabinets

WHEN ONE ELECTROLUX SALE LED TO THREE. Gustave Kellner, builder, installed Electrolux refrigerators in this new apartment at 145 Lincoln Road, Brooklyn. Then he specified them for two more new apartments. Illustration to left shows miniature of typical Electrolux page now appearing in national magazines.

IT started in Sweden seven years ago, this modern Arabian Nights story of heat that freezes. Two young scientists discovered a new principle of refrigeration. They used heat to make ice . . . without the aid of any mechanism . . . without using even a valve.

The new invention was tested and tried by scientists . . . engineers. They found no flaw in it . . . no reason why a refrigerator built on this new principle should ever wear out or need repairs. With these scientific tests and trials as a basis, the Electrolux refrigerator was built. It was an immediate success in Europe.

Then it was brought to the United States. Again it was tested . . . tested and approved by gas companies, builders, engineers, Good Housekeeping Institute, Delineator Institute, the New York Herald Tribune Institute. First sales were high . . . kept getting higher.

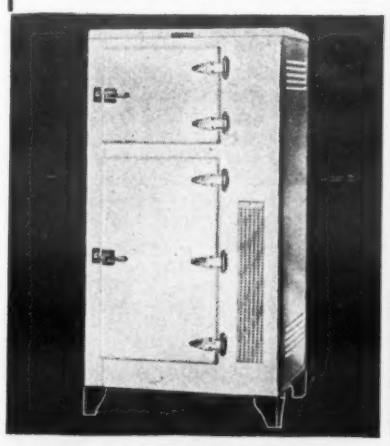
Today, tens of thousands of homes throughout the country are equipped with Electrolux. Thousands more are being equipped every month. Scores of the finest modern apartment houses have chosen Electrolux . . . apartments located in the most exclusive sections of New York City, Washington, D. C., Chicago, Philadelphia, Kew Gardens, Long Island. Letters are on file in Servel offices from many of these builders, telling of their satisfaction with Electrolux, stating that they will use no other refrigerator in new apartments they are building.

Every month now, more than four and a half million color-page advertisements in the Saturday Evening Post and Good Housekeeping are spreading the startling story of heat that freezes. The woman in the home—the man in the street—are talking about Electrolux in their ordinary conversations as they never have before.

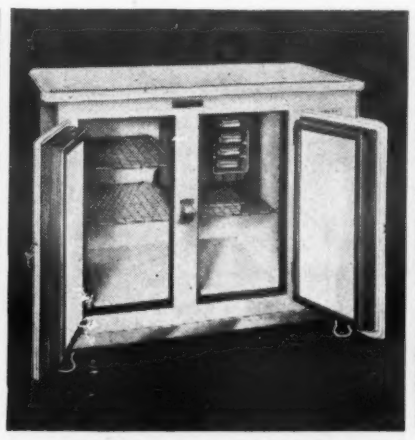
They are telling the story of ice made from a flame . . . comparing accounts of its low operating cost . . . giving Electrolux word-of-mouth advertising that brings many new sales to aggressive dealers.

If you want to find out more about the Electrolux line . . . if you would like more information about the eight models for all sizes of homes and apartments, finished in gleaming white or two beautiful modern colors . . . if you want to write a profitable chapter for yourself in the story of heat that freezes . . . write or wire today to Servel Sales, Inc., Evansville, Indiana, for full details.

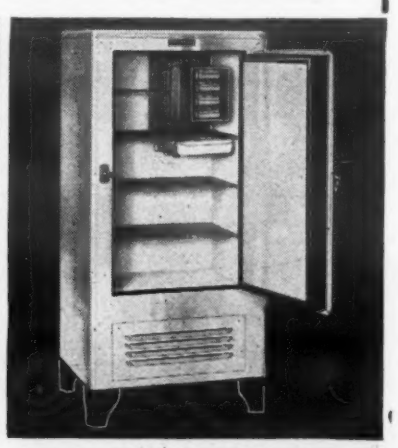
THREE SIZES · · · FROM COMPLETE LINE · · · OF EIGHT MODELS



PRICES OF ELECTROLUX LINE range from $225 to $510, F.O.B. Evansville, Indiana. CHEF model above sells for $345.



MODELS HAVE 3 TO 10 CUBIC FEET of storage capacity. DOUBLE DUTY model here has 5 cubic feet.



TWO COLORS BESIDES WHITE are offered, Crystal Green and Silver Gray. There is no additional charge for either finish.

ELECTROLUX THE GAS REFRIGERATOR

MADE BY SERVEL

Florist Refrigerators Require High Relative Humidities for Proper Keeping of Blossoms

A Temperature Between 48 and 52 Degrees And a Relative Humidity Between 85 and 90 Per Cent are Desirable

By Gerald S. Bataille, Director of Application
Harry L. Hussmann Refrigerator Co., St. Louis, Mo.

FLORIST refrigeration presents many interesting problems that in the majority of cases have a rather easy solution. Flowers differ in their requirements of refrigeration from those of foodstuffs. In the first place they have actual life. Secondly they require a great deal of moist air, and thirdly they must be preserved so that they will live a considerable time after they leave the refrigerator and enter the home.

Among florists and among refrigerating engineers there is a somewhat wide difference of opinion regarding proper flower preservation. This is because, no doubt, different flowers require different conditions in order to obtain the longest possible life while being refrigerated. But the consensus of opinion is, and laboratory tests have brought about certain standards that have given excellent results in practical application.

If a florist is mainly concerned about how long his flowers will keep in the refrigerator he will call for lower temperatures than the florist who is mostly concerned about how long his flowers will keep after being sold and delivered to the home.

A temperature of from 42° to 44° and a relative humidity of from 85 to 90 per cent will give about the best general results. (A wet and dry bulb thermometer will quickly give the relative humidity within the refrigerator.) A temperature of from 48° to 52° and a humidity of from 85 to 90 per cent will give splendid preservation and the best results from a point of longevity after the flowers reach the home.

Roses Are Very Perishable

Flowers, like foodstuffs, differ greatly in their length of life while being refrigerated. Roses, about the most perishable of all, are fortunately enough the best sellers. A florist generally turns his stock of roses over every day or at least every two days. Three days is about as long as the average rose will stand up under refrigeration and still have any amount of duration after being sold. Some certain types of roses will stand up six or seven days, but they are usually in the minority. A florist should try to anticipate his requirements on roses for the next day or two and buy accordingly.

Other types of flowers are somewhat more hardy. It is not unusual for lillies and carnations to stand up two and even three weeks and still be a salable flower. Snap dragons and Belgian tulips will stand up for about two weeks.

All that the majority of florists do to their flowers is to cut the stems each day and change the water. The writer has heard of many things florists are supposed to put in the water to keep the flowers longer. If this is true, I have never had a florist admit that he ever did such a thing. They advocate using nothing but fresh pure water each day, and trimming the stem of the flower with a good sharp pair of shears.

You will hear many arguments advanced as to whether or not mechanical refrigeration is superior to ice. Some florists will tell you that mechanical refrigeration ruined their flowers, while others will tell you it is the finest thing in the world. It is the finest thing in the world when properly applied. And therein lies a story.

To keep a refrigerator at a temperature of 50 degrees sounds like a mighty easy problem for electric refrigeration. And as a matter of fact it generally is. But besides temperature we must have a very high relative humidity.

Dry Air Makes Flowers Wither

We all know that a coil or brine tank will dehydrate the air and make it relatively dry. The sudden chilling of the air passing over the cold surface of the coil or brine tank causes the air to deposit its moisture on the surface thereof, which becomes the white frost we see on coils and tanks. The air is constantly passing over the cold surface and is constantly losing its moisture. This sometimes brings the relative humidity down to 40 or 45 per cent. This extremely dry air is very hard on the flowers, and causes them to wither.

The less surface there is to a tank or coil the greater the dehydration. If the proper amount of coil required for a given job were doubled, the relative humidity will just about double. More surface. That is the best answer to the problem at the present writing.

In many instances there is not sufficient room for so much coil surface. In such a case the writer would suggest that one of the flower compartments be utilized for additional coil space, or if that is not possible, would suggest the rebuilding of the entire bunker compartment. There is no question but that refrigerators built in the near future for florists will have ample room in the bunker compartment for oversize coil requirements.

When it is possible to double up on the coil surface, it is also possible to cut down on the size of the condensing unit used. This will partially offset the additional cost of the installation and will greatly reduce the cost of operation each year. So in the end doubling up on the coil surface is really an economy.

Extreme care should be used in calculating the load on florist refrigerators. They are generally built of as much glass area as insulated area. They are usually of one or two glass construction, and the doors are on rollers and slide open and shut. This in itself is a tremendous heat leakage factor. By very gently blowing cigarette smoke along the door sills and jambs this leakage of air can generally be indicated by the movement of the smoke. If the smoke moves briskly down and away from the sills and jambs there is no doubt a serious leakage of air around the door. Sometimes a little reconstruction work will greatly help this situation, but it is well to be sure that all these factors of excessive leakage are taken into consideration before determining the proper size unit for the application in question.

The average type florist display refrigerator should have considerable depth for its width, good clear glass doors, and good illumination. Wherever possible the illumination should be from the outside of the refrigerator. Electric light bulbs generate sufficient heat to cause excessive operation of the condensing unit, when the lights are placed on the inside of the refrigerator.

If the refrigerator is so designed that the lights must be located on the inside, it would be well to have one pilot light for constant illumination and a switch to turn on the balance of the lights when full illumination is required to properly display the flowers to a customer.

Due to the demand for uniformity of temperature throughout the refrigerator, the overhead coil compartment should be in demand for florist use. It will also provide a more moist air, and greater economy in the operation of the unit.

As the temperatures required by florists are relatively high, there is little difficulty of condensation appearing be-

(Concluded on page 7, column 2)

Electric Cooling Preserves Delicate Blossoms for Visitors to America's Convention City

This Atlantic City, N. J., flower shop was recently equipped with a Standard refrigerator, 12 ft. long, 4 ft. 2 in. deep, and 9 ft. high. It is cooled with a Kelvinator model B. B. compressor. One 4885 and one 4886 cross fin cooling coil are used, permitting a shallow bunker and giving additional height to the display compartment. George H. Berke is owner of the shop.

MODERN REFRIGERATION EFFECTS SAVING FOR LONG BEACH FLORISTS

By Helen Lockwood Coffin

Two years ago DuBose and Pratt, Frigidaire dealers in Long Beach, Calif., equipped the Art Florist shop, M. Rossi, owner, at First and Pine Street, with electric refrigeration. This period of operation has given ample time to test out the results and M. Rossi reports himself as highly pleased with the installation.

A model "C" compressor, with fin type coils, was installed, according to Glenn W. Pratt, a member of the firm. All the flowers are kept together in one cooler, at an even temperature of from 50 to 55 degrees. Flowers will keep nicely for from two to three weeks, according to their freshness and general condition when put into the case.

Equipment like that sold the Art Florist shop cost about six or seven hundred dollars. The cost of operation is about fifty per cent of the cost of ice.

A similar equipment has been installed recently for Robert Newcomb, florist, at 124 East First Street, Long Beach. Mr. Newcomb reports himself as thoroughly satisfied with his investment, even in the short time it has been in use.

WILLIAMS ICE-O-MATIC TO INCREASE SIZE OF BLOOMINGTON FACTORY

The Williams Oil-O-Matic Heating Corp., Bloomington, Ill., manufacturers of the Ice-O-Matic electric refrigerators, announce that two new factory buildings are now under construction at Bloomington. One of the buildings which will contain about 35,000 square feet of floor space will be devoted exclusively to the manufacture of refrigerators, while about half of the other unit with 17,500 square feet of floor space will be used for storing cabinets.

The two new buildings will cost approximately $100,000. Unit No. 5, which will be devoted to the manufacture of Ice-O-Matic units, will be completed by April 1, while the other building will be ready for occupancy by the first of May.

Detroit Merchant Features Electric Refrigeration in Advertising

Clarence Saunders, owner of a chain of grocery stores and meat markets in Detroit, stated in a page advertisement appearing recently in the Detroit Times that the food at his store is kept fresh and pure by Frigidaire automatic refrigeration.

The prominence given to the word Frigidaire, which is set in type about 1½ inches in depth, is indicative that Mr. Saunders is capitalizing on the popularity and sales appeal of electric refrigeration.

Foolishness

Paul Lorch of the New York Edison Company submits the following under the title, "Foolishness." We do not know what it means and Mr. Lorch fails to explain, except to say that it has nothing to do with the Metropolitan Refrigeration Committee of which he is chairman.

Boxes freeze
In the winters breeze
Good-bye B.T.U's
Through ice and sleet
No cubic feet
Ever wore rubbers on their shoes

FLORIST REFRIGERATORS NEED HIGH HUMIDITY

(Concluded from page 6)

tween the glasses, but cases where this might exist, if the doors were reglazed on a dry cold day, it will eliminate this condensation in the future.

Giving a florist a refrigerator with real display, good, well-built glass doors, overhead coil compartment if possible, and double the size coil ordinarily required, you have given him refrigeration similar to the kind a leading florist in one of our largest cities has today. In describing this refrigeration to the writer, the proprietor said, "We have had it for over ten years and it is the finest thing I have ever seen in my life for proper flower preservation."

Upon inspection of this particular installation it was found that there was double the coil required for temperature, but exactly the right amount for relative humidity which was approximately 88 per cent. Roses and violets (two of about the most perishable flowers) were standing up four, five, and six days in the finest kind of condition. Even with the remarkable refrigeration the proprietor confided that he tried to buy just enough to meet his demands for the next twenty-four hours.

It is absolutely imperative that good air circulation be maintained within the refrigerator. The flues of a florist refrigerator should be as large as it is possible to make them. If the flues are unusually small the air will be choked, and the flower preservation will be greatly hampered. The width of the cold air and the warm air flue should not be less than one inch to the foot of the width of the refrigerator. An inch and a half to the foot would be about the maximum width required. But cases where the width of the flues average about one-half inch to the foot are likely to give trouble, and the best thing to do is to entirely rebuild the bunker compartment, or to make such alterations necessary to increase the openings of the flues.

Florist refrigeration is a most desirable branch of the business. It should be cultivated more than it has been. It's a wonderful field, and the better the brand of refrigeration this division of the commercial field has, the more prosperous will become the florist and an even greater field can be created.

Black Lining Provides Contrasting Background For Floral Display in Rochester Shop

A "Dry-Kold" case, manufactured by the "Dry-Kold" Refrigerator Co., Niles, Mich., is used in one of the largest florist shops in Rochester, N. Y. The refrigerator is a special one 22 ft. long, 4 ft. deep, and 9 ft. high, cooled by Frigidaire equipment. The exterior of the case is finished in light green and the interior is finished with black Cararra glass lining each compartment, making an effective background for the display of flowers. Triple thicknesses of plate glass are used in the full length doors.

CONDEMNS PROPOSED BOYCOTT OF MAKERS OF SMALL MACHINES

Points Out Futility of Such Action by Ice Men

THAT the electric refrigerator is here to stay because it has been accepted by the public due to the advantages it presents over ice refrigeration, and that the proposed boycott of electric refrigerator manufacturers who make other products would be ineffective are the beliefs expressed by Van Rensselaer H. Greene in an address delivered at the fourteenth annual meeting of Virginia Ice Manufacturers' Association at Richmond, Va., which appears in February issue of *Ice and Refrigeration*.

Before discussing the proposed boycott, Mr. Greene stresses the point that the electric refrigerator does not belong to the class of here-today and gone-tomorrow mechanical contrivances, but it has been accepted because it presents certain advantages.

"For instance, apartment house dwellers in large cities," he says, "find superior satisfaction in the mechanical refrigerator. In a crowded community, where sneak thieves and crooks of all descriptions are constantly plying their evil trade, the woman who keeps house in an apartment has a natural aversion to opening her door to any outsider whatever and will welcome any opportunity to keep one more caller out.

"She loves to go shopping or gad about for other purposes, and she finds a blessing in anything that helps to relieve her from the necessity of being home at any stipulated hour. Possibly she likes to rise late and is prevented from so doing by the too early call of the ice man. The strongest objection against ice in apartments is the necessity which women are frequently put to of juggling the ice into the box themselves. You can't use any argument against the mechanical refrigerator that will greatly impress the women who uses her own hands to lift ice off a dumb-waiter or out of a dish pan in the hall."

This example, Mr. Greene points out, is to show that the mechanical unit has some advantages and that it is here to stay. When the ice manufacturer realizes this he ought to take a clear and unprejudiced view of where he stands when he lines up his forces to meet the competition. He should concentrate his vigor in fields where conditions are in his favor and his efforts toward concentration would not be assisted by the proposed boycott against the manufacturers of the mechanical unit.

"It is stated," he said, "that the ice industry spends many millions of dollars per year for equipment and supplies bought from these manufacturers. But even if this boycott were put into effect I question whether ice manufacturers would stick together with sufficient resolution to cause any significant loss of revenue to the boycotted concerns. But supposing the boycott were made effective and losses did occur, is there anybody who can imagine that the manufacturer of household machines would be induced to desist from competing with the ice manufacturers or take his device off the market!

"Some may say that it will pay the manufacturers back in their own coin for the injuries they have done and are doing to the ice business, and that there is a great satisfaction in retaliation. Satisfaction yes, but profit, no. Instead both industries have a common bond because they are trying to sell the nation increased refrigeration, and neither can accomplish any signal success without benefiting the other. The tremendous amount of advertising being done by the manufacturers of mechanical units has helped the sale of ice."

The introduction of this proposed boycott, Mr. Greene concludes, would produce effects at home because the local automobile dealer or electrical supply man knowing that the ice manufacturer won't give him his trade because the concern he represents makes mechanical units would tell his friends about your sore-headedness and they would in turn tell their friends. These would take delight in seeing him done out of business by the introduction of more mechanical units. Good will is the most effective weapon to use in competing with the electrical unit and the boycott would not aid in its development.

ELECTRIC DEVICE CO. ELECTS NEW OFFICERS; MOVES MAIN OFFICE

The Electric Device Co., distributor of General Electric refrigerators for western Massachusetts and the State of Vermont has established its main office at 110 State St., Springfield, Mass. Its former location was at 92 Rennie Ave., Pittsfield. The company has a branch office at 197 College St., Burlington, Vt.

At the annual meeting, Feb. 12, George H. French was elected president, D. B. Murphy, treasurer and Douglas Clark, assistant treasurer. Mr. French, who formerly managed the Mountain Electric Supplies Co., General Electric distributor in Pittsfield, is now giving his entire time to the refrigerator business. A number of new dealers are being appointed in the territory. A new department for apartment houses and commercial activities has been formed, under the management of Clark B. Harding. The Southern Berkshire Power & Electric Co. has been appointed dealer for Lenox, Stockbridge, and Great Barrington, and Shack's Electric Store for Shelburne Falls and the surrounding towns in Massachusetts. The Greenfield dealer, Baldwin-Starkey Company, has moved to a new location at 75 Federal St. At present the number of Electric Device Company dealers totals about 75.

J. E. Black, Former Minneapolis Frigidaire Man, Dies

J. E. Black, formerly with the Frigidaire branch at Minneapolis, Minn., and the Montana-Dakota Power Co., Williston, N. Dak., passed away at his home in Springfield, Mo., on Feb. 4.

After leaving the Frigidaire branch Mr. Black became sales supervisor for the Montana-Dakota Power Co., and after a successful year with this company resigned and returned to his old home in Springfield.

P. C. Wagner Appointed Water Cooler Specialist by G. E.

P. C. Wagner has been appointed water cooler specialist of the commercial division by General Electric Co., Cleveland. Mr. Wagner has been Cincinnati district representative. He will now devote his time to developing the water cooler business through the distributors.

Appointed Frigidaire Dealer in Northwest Territory

H. H. Steele & Son, Seattle, Wash., have been appointed Frigidaire dealers for the Rainier Valley district.

Copeland Presented In Two Languages By South American Distributor

How Copeland electric refrigeration is being presented in foreign countries is illustrated in the above picture of the showroom of Vines & Co., distributors in Sao Paulo, Brazil. The placards placed about the showroom are printed in both English and Spanish.

Service and Installation Men Should Conduct Themselves as Ambassadors to the Customer

A Neat Installation and Courteous Workmen Pay Dividends . . . . A Satisfied Customer Is a Booster for the Firm and the Product

By Willis Parker

THE service man in the electric refrigeration activities of any company is that company's ambassador to its customers, says J. M. Eakins, manager of the electric refrigeration department of the Public Service Co. of Colorado at Denver. Therefore he should conduct himself in the presence of the customer and in all dealings with the customer in a manner that reflects credit upon himself and the company for which he works.

This company has a well organized service department. After the sale has been completed the service man, who may also be an installation man, is the one who makes the most contacts with the customers henceforth, to all intents and purposes, he is the company. As we shall discuss the service department henceforth, we shall include the installation men under the heading of service men, also, because it is quite evident that an installation man is fully capable of handling service calls when necessary and in fact the organization is such that the two types of activities may be handled by any and all of the crew.

Starting at the beginning—with the installation—the service to the customer begins. It is the customer's first contact with the service department and much of the housewife's initial enjoyment of the new appliance will depend upon the method in which it is installed and the actions of those installing it.

Hence the rule of cleanliness.

A Quality Appliance

"We endeavor to impress upon all of our customers that an electric refrigerator is a quality appliance," explained Mr. Eakins. "No person would permit a $200 watch to lie around in dust and dirt so why be careless of an electrical appliance costing a similar amount? We have gone to the expense of buying covers and pads with which we wrap up the refrigerator while transporting it from our warehouse to the customer's kitchen. Two objects are accomplished by this. The first is that of reducing the probability of scratches and marring while handling and the second is that of impressing upon the customer's mind that she is getting a quality article. We deliver the refrigerator in the same way that a music company delivers a piano or phonograph.

'Before the installation is made, however, an engineer from the service department visits the home or the store and considers the place of installation. It frequently happens that the salesman does not take this point into consideration and may agree with the customer that the condenser may be placed in a position that will not be most efficient. The engineer is expected to catch these points and arrange to make an installation that will permit maximum efficiency of the appliance. He marks the position of the box and of the condenser so that when the installation men arrive they waste no time in locating either item.

It is a rule in the service department, which is headed by T. M. Foulk, that men shall change their overalls at least twice a week. I am in favor of white overalls for the boys as a means of sooner detecting 'dirty dirt'. We have this rule so that the possibilities of the men rubbing their clothing against clean kitchen walls and soiling them by the dirt on their garments are reduced. Regardless of how well pleased the housewife is with a new electric refrigerator, her pleasure is somewhat reduced by noting that the walls around it have been soiled while the installation was being made.

"We require that our installation men thoroughly clean up the premises when their job is completed. Consider the fire department. It used to be that the firemen rushed to the blaze, poured water upon it, extinguished it and departed. Nowadays they arm themselves with brooms, mops and other paraphernalia and clean up the place after extinguishing the blaze. The installation crew should do the same thing and permit no bits of wire, no saw dust, no dirt of any kind to remain. Such actions reflect credit on the company and increase the housewife's pleasure in the investment.

"We require our service men to shave every day, to wear neckties and, while we lay down no hard and fast rules relative to their clothing and shoes, other than that of changing their overalls at least twice a week, we do expect them to be dressed neatly and to wear shoes that are clean whether they are well polished or not.

"On domestic installations, smoking is absolutely forbidden.

"A neat installation and courteous workmen pay dividends, inasmuch as a satisfied customer is a booster for the firm, and for the product.

The Service Department

"Now, as to the servicing of the appliances after they have been installed. Despite the fact that henceforth the service men are the ones who contact the customers and represent the company, these contacts are few and far between, for our service calls average .76 per unit per year. Some customers put in service calls frequently; others very seldom. But we are prepared to give 24 hour service. The service department, which, as explained includes the installation crew, consists of fifteen men, any one of whom is capable of handling a service call. We assign two or three of the men to strictly service work and have the others for emergencies when necessary.

One service man goes on duty at 7 a. m. and works until 4 p. m. At 8 a. m. an installation man is assigned to service if he is needed and he works until 5 p. m. A second service man goes on duty at noon and works until 8 p. m. By such overlapping we have two men available from 8 to 12; three from twelve to 4 p. m. although it is customary for the installation man to quit the service crew at noon and go on other work. Another service man goes on duty at 6 p. m. and works until 6 a. m. He has assistance until 8 p. m.

"We get 90 per cent of our service calls between 7 a. m. and 2 p. m. The calls are heaviest, however, between 7 and 9 o'clock. We explain it by assuming that, in case trouble occurs or is discovered around 6 p. m., the customers decide to wait until morning before calling us, unless it is a gas leakage. Troubles are usually discovered at meal times.

"We do not endeavor to give 'instantaneous service' unless it is a gas leakage, but do endeavor to give 2 hour service on all calls. Our average cost of a service call is $1.10. Our minimum charge to the customer is $1.50.

"As a further indication of cleanliness in service, the boys are instructed to take a rag and wipe the refrigerator off inside and out when they have finished their work."

SAVAGE OPENS NEW ENGLAND BRANCH OFFICE AT BOSTON

The Savage Products Distributing Corp., selling subsidiary of the Savage Arms Corp., Utica, N. Y., has opened a branch sales office in Boston. William L. Howlett, manager of sales of the New England refrigeration division, will be in charge of the office which is located at 504 Union Savings Bank building.

Mr. Howlett has been connected with the refrigeration division of the company for the past four years. Recently he acted as assistant sales manager in the middle western territory.

Milwaukee Concern Changes Name

The Electric Refrigerator Co., at 121 Second St., Milwaukee, Wis., eastern Wisconsin distributors of General electric refrigerators, has changed its name to E. H. Schaefer Corporation, with E. H. Schaefer as president.

Claims Time Element Alone Is The Determining Factor in Temperature Regulations

Urges Reference to Recommendations Made By Commercial Refrigerator Manufacturers; Says Chart Offers Basis for Debate

Paper by R. E. Ottenheimer, president and general manager of Ottenheimer Bros., Inc., Baltimore, read before the Commercial Refrigerator Manufacturers' Association at its meeting in Detroit, Feb. 21-22.

EVER since this planet of ours was first inhabited, we presume the question of temperature has been the chief source of complaint. In the tropics there is too much heat. At the poles there is too much cold. And in between there is too much temperature of one kind or another to suit the specifications and requirements of human beings. It can be understood readily that a subject so debatable in our every day lives should bring forth tremendous variations of opinion, when an attempt is made to determine a standard policy for temperature recommendations for use in portable commercial refrigerators.

We have four distinct groups to satisfy:

1. The refrigerating engineer—practical and technical.
2. The manufacturer—of refrigeration machinery, ice and refrigerators.
3. The user—management of public institutions; purveyors of perishable commodities at retail.
4. The general public—ultimately.

The viewpoint of each being distinctly different, and, from his premise, correctly different, it necessarily requires a mutual, sympathetic understanding of each other's problems to broaden the individual views sufficiently to accomplish a compromise that will at least temporarily reduce the chaos and economic waste that now exists in this field.

User's Problem is the Fundamental One To be Solved

The mathematical precision of the trained engineer might, in fact, has, dictated limitations unprofitable to the user of commercial refrigerators. The user's problem is the fundamental one to be solved. There should be a practical, common sense agreement of all factions, postponing the strictly abstract technical findings for a later date.

Perhaps in the past we have approached this subject "hind-end foremost" by discussing "cold," while our vital concern should be what is the highest temperature at which foods can be efficiently stored, sold and delivered to the table for human consumption.

These conclusions must be based on a thorough knowledge of food chemistry, and then translated into practical methods of handling. Except when the makers of commercial refrigeration tell the user that he requires unnecessarily low temperatures, he certainly would not want them, if he realizes that for each degree of difference beyond what is really necessary for the proper preservation of his product, he is committing economic waste.

Smaller Depreciation and Service Costs

Now, if the butcher and the grocer and the restaurateur do not use extremely low temperatures, they will get more usable service per K. W. for each dollar spent for power—a direct monetary saving—plus many years of additional life to the refrigerator and the refrigerating apparatus, thus again reducing their overhead operating costs, through smaller depreciation and service costs.

As far apart as the poles have been our views of temperature requirements, because our premises have been unsound. The time element alone is the determining factor for temperature regulations. Everybody recognizes the fundamental correctness of this statement, but in the enthusiasm of the debate as to what are correct temperatures for use in commercial refrigeration, volumes have been written and months of oratory loosened in an endeavor to make everyone else conform to a pet theory tenaciously embraced and ridden as a hobby.

The whole scale, degree for degree from 28 to 50, has been offered for keeping meats, vegetables, etc., without considering the period in hours or days of refrigeration requirement.

A moderate consideration of the detailed use and practise of the various types of business requiring commercial refrigerators is necessary to determine the length of time each kind of perishable commodity must be protected.

The statement is often made that milk must be kept at a temperature under 50, yet we know that even in the heat of summer, with temperatures at from 65 to 85 degrees, the milk man comes around at three or four o'clock in the morning and deposits the bottles of milk for the day's supply on our doorsteps. It would not be practical to ring up the household to come down and take in the milk at this time of the morning. The public would not be happy with this kind of service.

So, we find that three or four hours of exposure of milk to such temperatures that has been properly refrigerated by the wholesaler does not lessen its value for human consumption, merely because some few hundred thousand additional bacteria may have developed during this relatively short period. However, if this same milk were subjected to this constant high temperature for 24 hours, during which time the bacteria would multiply by mathematical progression, it would be unfit for use.

We have heard people say that fresh meats must be kept at temperatures below 36 degrees, and quite properly so, provided they are to be stored for a long period, or in certain climates and under peculiar conditions of humidity. But everyone has had the experience of buying a roast of beef at the market on a summer day, taking it home in an automobile, or having it delivered by truck, and very likely subjected to summer temperatures over a period of two or three hours, after which time the rapid propagation of bacteria was arrested in the family ice box, or in the frying pan, or oven, without any damage whatever to its value as an item of diet.

In discussing a subject of such vital importance, you may ask: What place have these simple, homely similes? The answer is just this:

In the very recent tremendous increase in interest taken in refrigeration generally, the exploiter has taken the floor while we, the manufacturers, have relinquished our experienced perspective on the practical, common, everyday uses and habits of the public. Lack of this detailed knowledge has been responsible for confusion, misinformation and extravagance.

Let's look into a few shops. There is the retail meat market operator. His equipment generally begins with a retail storage refrigerator. We will consider him a good average business man. Therefore, he knows that his net profit depends on the number of times he turns his capital over, so he only buys such grades and classes of meat as he thinks he can move quickly. Three to five days would be the extreme average storage time required of his refrigerator. Temperatures, maintained under proper conditions of humidity between the range of 38 to 45 degrees, are ideal for him.

He also has one or more display refrigerator counters, which having one or more walls of glass are obviously uneconomical for lengthy storage purposes. His motive in buying this display equipment was for the purpose of creating a more active demand for his commodity, and he bends every effort to move the merchandise in his counters quickly.

In the well conducted meat market having display refrigerator counters (those having additional storage features excepted) the average length of time that any product remains in the case will be well under 24 hours. Therefore, the use of temperatures lower than from 43 to 48 degrees would prove most extravagant.

Hotels Keep Meat in Refrigerators For Short Period

Go into the service kitchens of hotel and institution. We find the products are taken from the general storage refrigerators owned by the institution, or else brought in from the wholesale house. The meat is then cut up into smaller cuts, according to the requirements of the day, and is placed in the lower part of the refrigerator in the area indicated for fresh meats. In this type of general service refrigerator are also kept vegetables, fruit and cooked meats.

As these latter commodities will properly be preserved at temperatures considerably higher than the fresh meat, the "side icer" refrigerator is usually indicated, and, therefore, a temperature of 42 to 48 degrees in the lower part where the fresh meat, milk and eggs are to be stored, would probably give the relatively higher and proper temperature in the upper part. As the outside temperatures in the kitchen and pantry of public institutions are usually extremely high, an endeavor to maintain temperatures lower than the above would be quite expensive. Consequently, the careful management of such institutions carefully refrain from having on hand in their service boxes perishable meat delicacies for a period longer than 48 hours, and, for which purpose, the above temperatures are ideal.

Flowers wilt rapidly in low temperatures. It would be unwise ever to run a refrigerator for this purpose lower than 48 degrees.

Consideration of the proper temperatures for wholesale storage of foods and other perishables is a matter that is more susceptible to scientific determination of temperatures, because of the much greater length of storage time.

Committee Represents Machine and Cabinet Manufacturers

A committee was appointed about two years ago to represent many of the important refrigerator manufacturers and those making commercial ice machines. They had at their disposal the information, both practical and technical, of the engineering offices of every company represented. This exhaustive study brought forth a tremendous variation of viewpoints which will readily be appreciated.

From this mass of opinions finally evolved a recommendation for temperatures in portable commercial refrigerators to be adopted generally by those wishing to participate in the movement to determine reasonable operating conditions for the benefit of the users of commercial refrigerators. This chart at best was a compromise by the members of this committee, but primarily keeping the purchaser's interests in mind. It is recommended that it be constantly the subject of organized study and revision. It is far from accurate, but, representing as it does, entire agreement among those who have spent the greatest number of years in the study of conditions in the commercial refrigeration field, it should do much to allay the chaos, misunderstanding and unwarranted field service that has been so terrifically expensive to everybody engaged in this industry, both seller and buyer included.

One particularly happy result of the adoption of this committee's recommendations should be that the warring factions in temperature debates will at least have a platform upon which to fight in the future.

Recommendations of Commercial Refrigeration Committee

(Concluded from page 1, Column 5)

tion has been prepared after a very careful and painstaking investigation of the subject in question. The committee in issuing it feel that compliance with it will prove an economy to users of commercial refrigerator equipment through preventing the spoilage of foods, as well as the damage to the equipment, both of which are frequently caused by the carrying of unnecessarily low temperatures.

The Joint Commercial Refrigeration Committee is a joint committee comprised of members of the Refrigerating Machinery Association, the National trade association of ice machinery manufacturers and the Commercial Refrigerator Manufacturers, the National Trade association of manufacturers of commercial refrigerators and cooling rooms. The recommendation given above has been unanimously adopted by both of these trade associations.

This recommendation has been and will be presented to all interested organizations or firms engaged in the production of any form of mechanical refrigeration equipment who is interested in any manner or affected by it. The co-operation of all organizations and firms in the industry in the recommendation is respectfully requested.

JOINT COMMERCIAL REFRIGERATION COMMITTEE,
C. F. E. LUCE, Secretary.

Description of Article	Location of Thermometer	From Deg. Named Below	To Deg. Named Below
Small market cooling room	Center of rear wall	38	45
Large storage cooling room	Center of rear wall	36	42
Grocers' refrigerator	Small lower compartment	42	48
Restaurant service refrigerator	Small lower compartment	42	48
Restaurant storage cooling room	Center of rear wall	38	45
Florist's refrigerator	Center of rear wall	48	54
Top display case	Center of bottom	42	48
Floor display counter	Center of bottom	42	48
Floor display counter	Center of bottom	36	40
Heavy construction	Center of top shelf	44	48

L. E. Koch Leaves Absolute Contactor Corp.

L. E. Koch, chief engineer of the Absolute Contactor Corp., Elkhart, Ind., which recently merged with three other concerns to form the Time-O-Stat Controls Co., has resigned his connection with the new firm.

Gregory V. Rose, Inc., Named Chicago Distributors for Holmes

Gregory V. Rose, Inc., 315 North Michigan Avenue, Chicago, Illinois, announce their appointment as distributors for Holmes electric refrigerators. The display rooms of this firm were opened to the public on Feb. 8. A. De B. Gaines, well known in the refrigeration industry through his connection with several of the larger manufacturers, is sales manager.

Frigidaire Officials Go to Portland After San Francisco Meeting

Following the regional convention of Frigidaire Corp. salesmen at San Francisco, March 15, officials from Dayton will visit in Portland, according to W. W. Tyler, Portland branch manager. The party will include R. F. Callaway, manager of branches; L. S. Keilholtz, chief engineer; T. B. Fordham, works manager; D. K. Banker, comptroller.

SAYS MEMBERSHIP OF CODE COMMITTEE IS NOT REPRESENTATIVE

Asks Adjustment to Include Four Additional Groups

AMERICAN ICE MACHINE CO.
Glendale, California

February 13, 1929

Electric Refrigeration News,
Detroit, Michigan.

We note that the sectional committee on refrigeration has submitted a proposed safety code to American Standards Association, and that in this code an attempt is made to cover the subject of multiple refrigerating plants, so-called.

The By-Laws of the American Standards Association (Section 39) provide that in acting on a standard offered for approval considers "the procedure followed in the formulation of the standard, the adequacy of representation of the various interests concerned on the sectional committee, and the action by which the standard was adopted," but that it does not "concern itself with the technical details of the standard."

We also note that the membership sectional committees dealing with safety codes is classified as

(a) Manufacturers
(b) Employers
(c) Employees
(d) Governmental
(e) Independent
(f) Insurance

We beg to call attention to the fact that within the past few years the number of multiple dwellings built has rapidly increased, and that this fact together with the development of what is known as direct multiple refrigeration installations has led to the spending of huge sums annually in refrigeration plants in these apartment buildings.

We submit the following as the four general types of refrigeration installation being used in multiple dwellings:

(1) Central plant with circulating brine to apartments.
(2) Separate self-contained refrigerating plant for each apartment.
(3) several direct multiple systems (usually one system for each 15 to 24 apartments).
(4) *Central direct multiple system.*

Manufacturers representing the first three of these methods are represented under "(a) classification" on the sectional committee. The last of these methods, while the newest in the field, will in our opinion soon be the most common, for reasons of public safety, economy and convenience. One firm in Chicago is said to have installed this type of equipment in 10,000 apartment kitchens in the past year.

Due, no doubt, to the fact that this is a recently developed method, we find that the manufacturers of this type of plant are, as a group, without representation on the sectional committee, although some of them may also belong to other groups which have representation.

We call attention to the fact that, although our field experience has shown that the compressor equipment manufactured by the "heavy refrigerating machine" industry is much more adaptable to satisfactory multiple refrigeration installations than the fractional tonnage machines known as "electric refrigerators," the former group of veteran manufacturers have, nevertheless, not yet awakened to this fact, and cannot, therefore, be properly grouped with manufacturers of multiple refrigeration plants under "(3)" or "(4)" above.

Three Groups Unrepresented

In addition to the small but, we believe, increasingly important group sponsoring the central multiple refrigeration plant, there are three other groups which are apparently practically without voice or without adequate voice on the sectional committee for mechanical refrigeration, but which in the light of present developments should, it would seem, certainly be represented. They are:

(1) Architects
(2) Apartment house builders
(3) Apartment house owners and lessees

It is interesting to note that practically the entire present representation under "(b) Employers," is composed of ice manufacturers, who, although employers of refrigeration machinery are primarily manufacturers, and that they are, moreover in direct competition with the two groups manufacturing multiple plants. The purchasers and owners of apartment house refrigeration equipment costing millions of dollars annually (undoubtedly a substantial portion of the total refrigeration equipment manufactured) would certainly seem entitled to be well represented, both directly, and through their technical advisers, the architects and builders.

Code Does Not Meet Requirements of General Acceptance

In view of the above facts, we believe that the proposed Mechanical Refrigeration Safety Code, including in its scope, as it does, central direct multiple refrigerating plants, cannot be considered to meet the requirement of "general acceptance" of those substantially concerned.

It would therefore seem to be in direct violation of the established policy of the American Standards Association to approve a refrigeration safety code until the sectional committee can be so adjusted as to meet the present revised situation by including:

(1) Manufacturers of central direct multiple refrigerating plants.
(2) Architects.
(3) Apartment house builders.
(4) Apartment house owners and lessees

As an alternative to adequate representation from each of these groups on the present sectional committee, consideration might be given to the formation of a separate sectional committee to study the new but important field of multiple refrigeration in residential apartment buildings.

The world is looking to the American Standards Association for guidance in the matter of public safety in apartment house refrigeration installations. The esteem in which the association is held places a grave responsibility indeed upon its shoulders, particularly in so important an industry as the multiple refrigeration business is coming to be.

Municipalities are naturally looking to these codes for standards upon which to base safety ordinances covering multiple installations.

It is the present tendency to "rush into print" with whatever appears on this subject, and legal restrictions, once on the statute books are difficult to abridge when conditions change.

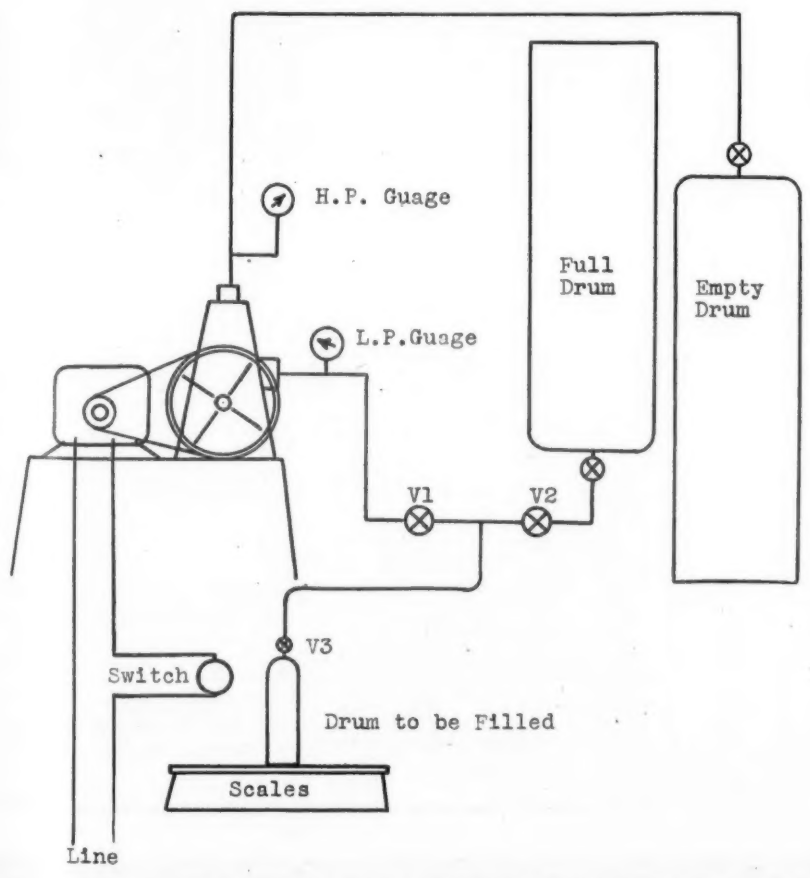
Let us therefore not have a code which (1) falls short of being safe on the one hand, and which (2) discriminates against the safest type of equipment on the other hand, because it was not formulated by a representative body.

Very truly yours,
E. F. BELDIN,
American Ice Machine Co.,
Glendale, California.

Installation and Service

Simple and Efficient Method for Filling Small Service Drums Accurately and With No Waste

By B. A. Johnson, Berwyn, Ill.



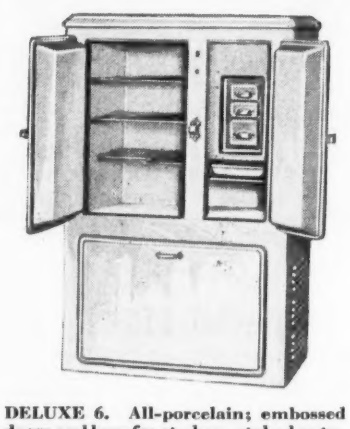
Above is a schematic diagram of a method used for filling small service drums from a large supply drum of refrigerant. A spare compressor is used to pump just enough gas out of the small drum to lower its pressure enough to cool it. (The gas that is pumped away from the small drum is collected in a large empty drum.) Then the valve from the supply drum is opened and enough refrigerant allowed to run into the small drum to fill it the desired amount as can be determined by the scales. The excess gas in the connecting lines is then pumped out after the supply from the large drum is shut off. The small drum can then be removed with no loss of gas or unpleasant odors.

The procedure is as follows:

1. When the apparatus is not in use V1 and V2 are closed.
2. Attach small drum and purge air from the lines. Leave V3 open.
3. Open V1 and run the compressor until enough gas is removed from the small drum to make it cool.
4. Stop motor, close V1 and open V2 and allow enough refrigerant to run into the small drum to properly fill it.
5. Close V2 and V3 and run the compressor long enough to reduce the pressure in the lines to 0 lbs. guage.
6. Close V1 and remove the small drum.

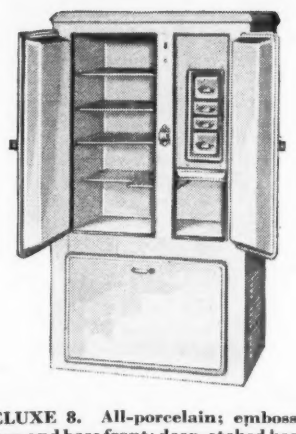
A better, broader line of COPE
New Models — New Qu

HOUSEHOLD MODELS

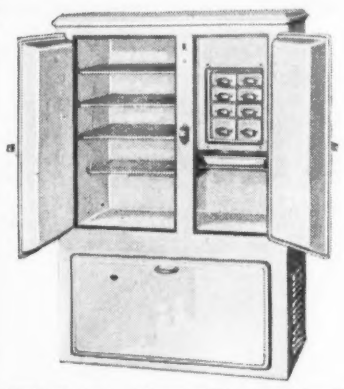


DELUXE 6. All-porcelain; embossed doors and base front; deep-etched automatic hardware; top in six color choices; electrically lighted; 6.5 cu. ft. storage; over 12 sq. ft. shelf area; 108 ice cubes, 6.95 lbs. ice; 3 ice trays, 1 double-depth; 2″ wrapped corkboard insulation; no drain pipe; Coldtray for salads, cubes, etc.; vegetable bin if desired.

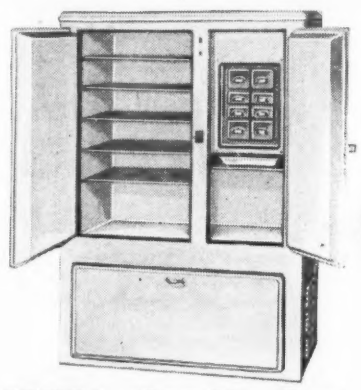
DELUXE 20. All-porcelain; embossed doors and base front; deep-etched, automatic hardware; top in six color choices; electrically lighted; 20.5 cu. ft. storage; 36 sq. ft. shelf area; 378 ice cubes, 24.5 lbs. ice; 10 ice trays, 4 double-depth; 3″ and 4″ wrapped corkboard insulation; no drain pipe; Coldtray for salads, cubes, etc.; shelf compartment below at left; additional vegetable bin if desired.



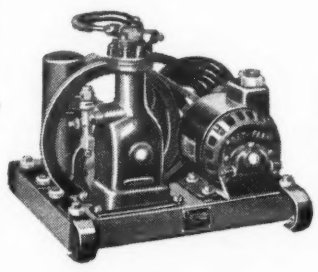
DELUXE 8. All-porcelain; embossed doors and base front; deep-etched hardware, automatic; top in six optional colors; electrically lighted; over 8¼ cu. ft. storage; over 14½ sq. ft. shelf area; 162 ice cubes, 10.6 lbs. ice; 4 ice trays, 2 double-depth; 2″ wrapped corkboard; no drain pipe; Cold tray for salads, cubes; vegetable bin if desired.



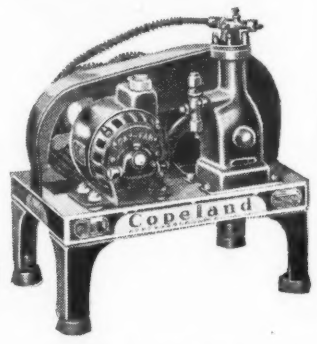
DELUXE 10. All-porcelain; embossed doors and base fronts; deep-etched automatic hardware; top in six optional colors; electrically lighted; 10¾ cu. ft. storage; over 17½ sq. ft. shelf area; 270 ice cubes, 17.2 lbs. ice; 8 ice trays, 2 double-depth; 2″ and 3″ wrapped corkboard insulation; no drain pipe; Coldtray for salads, cubes, etc.; vegetable bin if desired.



DELUXE 14. All-porcelain; embossed doors and base front; deep-etched automatic hardware; top in six optional colors; electrically lighted; 14¾ cu. ft. storage; over 24 sq. ft. shelf area; 324 ice cubes, 21.2 lbs. ice; 8 ice trays, 4 double-depth; 3″ and 4″ wrapped corkboard insulation; no drain pipe; Coldtray for crisping salads, storing ice cubes, etc.; vegetable bin if desired.



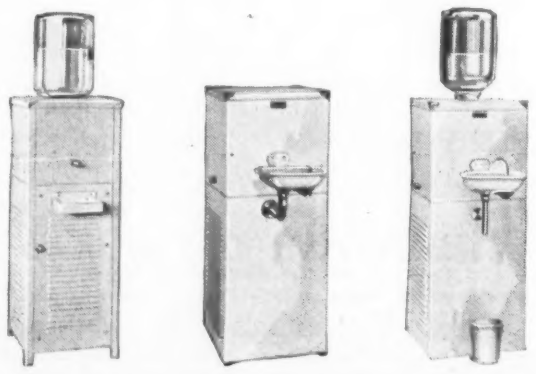
MODEL "N" condensing unit, for self-contained installation in cabinets up to and including 7 cu. ft. Single cylinder, ⅙-h.p. motor mounted in rubber on pressed steel base. Entire unit spring and rubber mounted.



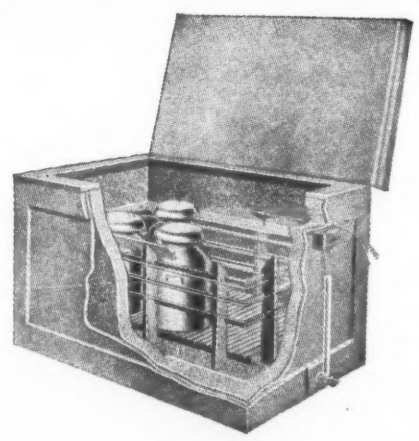
MODEL "O" condensing unit for remote installation with cabinets up to and including 20 cu. ft. Single cylinder, ⅙-h.p. motor; rubber pads under legs; belt guard. Available also as Model "I" without legs and guard for self contained installation.

WATER COOLERS

Three models in all. Model "P" for bottle supply only; reserve capacity over four gallons; cooling capacity 100 drinks per hour. Models "L" and "M" for city water supply or bottle; choice of compressors to fit requirements; cooling capacities 6 to 14 gal. per hour.



MILK CABINETS



Copeland Milk Cooling Cabinets are specially designed to quickly cool milk on the dairy farm with Copeland refrigerating systems. Constant temperatures in the cabinet automatically maintained. Copeland systems cover a wide range of capacities to meet all requirements.

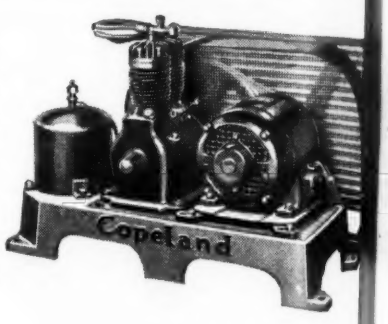
Dramatically, Mr. W. D. McElhinny, Vice-President of Copeland Sales Company, rang up the curtain at the Players Club, Detroit, on February 5, and disclosed the entire Copeland line to the distributors and dealers assembled in convention:

"There it is," he said. "It's YOURS. We made it for YOU. We made it so well, we made it so all-inclusive and we priced it so low that Copeland in 1929 is out of a competitive class. Success is practically guaranteed Copeland dealers who conduct their business in a sound manner!"

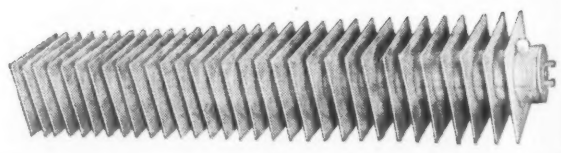
* * * *

Three lines of *domestic* — 12 complete models in all, with storage capacities from 5 to 20 cubic feet, factory priced from $195 to $720. Many sizes of *separate units for present ice boxes*—enough to electrify every good refrigerator in every community in the United States. Cooling coils, condensers and cabinets for apartment house *multiple installation*. *Water coolers* for factory, store, restaurant or office; bottle or city supply. An infinite number of units of various sizes and types for all classes of *commercial refrigeration*—adaptable to walk-in boxes, display counters, soda fountains, ice cream cabinets and milk coolers.

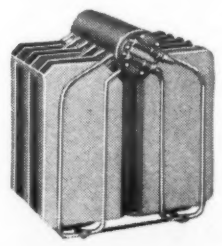
COMMERCIAL REF



MODEL "XA" condensing unit, air-cooled; capacity 1200 lbs. refrigeration per 24 hrs.; 2 cylinder compressor; 1½-h.p. motor; V-belt drive; safety shut-off. This is one of 6 air-cooled condensing units of wide capacity range.



ZERO TUBE NO. 175, 48″ end to end; 31 fins; self-defrosting. Seven zero tubes in all, from 12″ to 96″ length. Can be connected up as single unit, or in series or in parallel



COOLING COIL 6-Z, special Copeland flue-type; high efficiency; max. compartment 23½″ x 27″ x 17½″ deep; min. door opening 21″ x 23″. One of 7 sizes and types for all requirements; with and without ice trays.

Copeland

DEPENDABLE ELECTRIC REFRIGERATION

PELANDS *for every purpose!*
Quietness — New Value

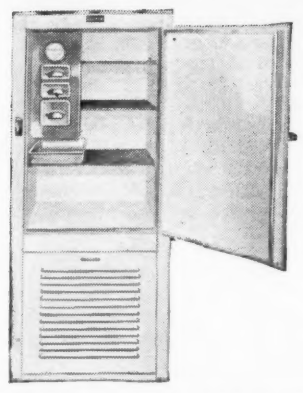
The broadest range of electric refrigeration ever offered by Copeland. And *entirely new*—new in beauty, new in quietness, new in efficiency, new in price, new in value. Destined to elevate Copeland to new heights of popularity . . . destined to elevate Copeland distributors and dealers to new heights of prosperity.

Copeland's distributors and dealers are fortunate in having this valuable new line . . . they're going to make more money this year than they ever thought possible. But how about *you*? . . . are you going to continue *matching* dollars instead of *making* them? Are you going to continue making *sales* alone instead of making sales and *profit?*

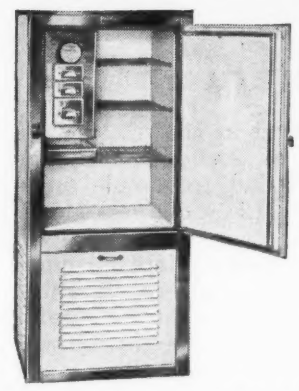
Last year is gone; you can't do anything about it; you alone know what returns you got for the amount of energy and money expended. But the year 1929 is just breaking, so why not face the facts? *Copeland has the finest money-making proposition ever offered in the electric refrigeration field!* If you want to get into the electric refrigeration business on a sound basis, write us today, telling us something of your accomplishments, your ambitions and your hopes; tell us these things and we will do the rest.

COPELAND SALES COMPANY, 630 Lycaste, Detroit, Mich.

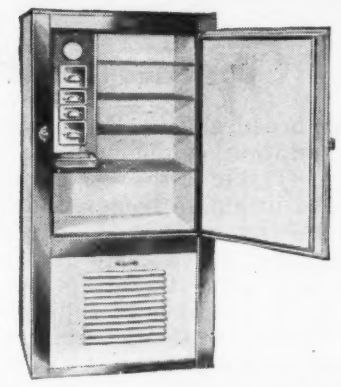
HOUSEHOLD MODELS



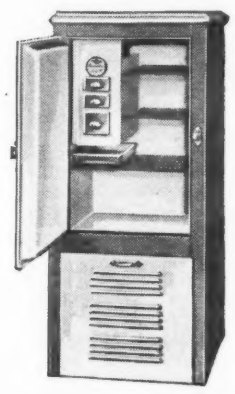
N-5-SPECIAL. Lacquered steel exterior; porcelain interior; over 5 cu. ft. storage; over 7¾ sq. ft. shelf area; 108 ice cubes, 6.95 lbs. ice; 3 ice trays, 1 double-depth; no drain pipe; Coldtray for crisping salads, storing cubes, etc. This model also as N-5 with enameled interior.



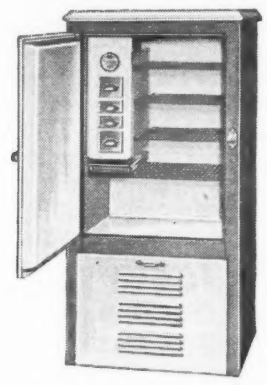
N-5-P. Lacquered steel exterior, bright metal (Super Ascaloy) trim; porcelain interior; over 5 cu. ft. storage; 7¾ sq. ft. shelf area; 108 ice cubes, 6.95 lbs. ice; 3 ice trays, 1 double-depth; no drain pipe; Coldtray for crisping salads, storing ice cubes, etc. Shelves at convenient height.



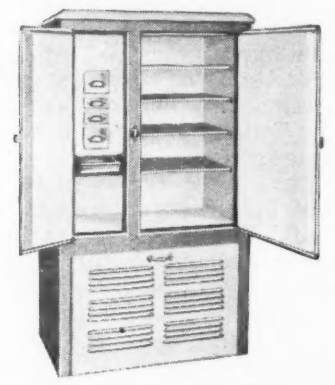
N-7-P. Lacquered steel exterior, bright metal (Super Ascaloy) trim; porcelain interior; over 7 cu. ft. storage; 12¾ sq. ft. shelf area; 162 ice cubes, 10.6 lbs. ice; 4 ice trays, 2 double-depth; no drain pipe; Coldtray for crisping salads, storing ice cubes, etc. Shelves at convenient height.



CS-5. All-porcelain; gray cabinet; white top, doors and louvre panel; deep-etched automatic hardware; over 5 cu. ft. storage; 8 sq. ft. shelf area; 108 ice cubes, 6.95 lbs. ice; 3 ice trays, 1 double-depth; 2″ highest quality insulation; Coldtray for salads, cubes, etc.; no drain pipe.



CS-7. All-porcelain; gray cabinet; white top, doors and louvre panel; deep-etched automatic hardware; 7¼ cu. ft. storage; over 12½ sq. ft. shelf area; 162 ice cubes, 10.6 lbs. ice; 4 ice trays, 2 double-depth; 2″ highest quality insulation; Coldtray for salads, cubes, etc.; no drain pipe.

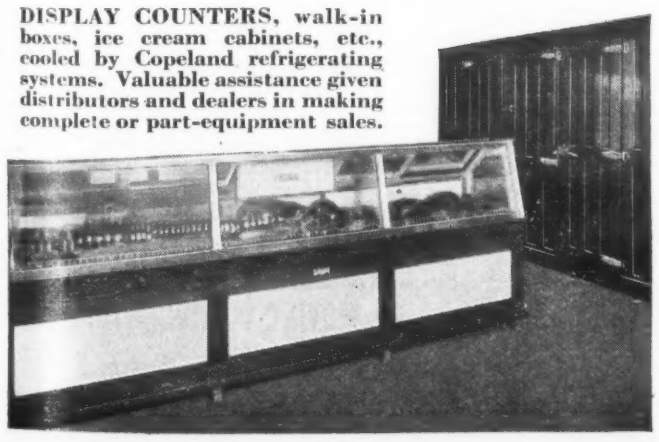


CS-9. All-porcelain; gray cabinet; white top, doors and louvre panel; deep-etched automatic hardware; over 9 cu. ft. storage; 15¾ sq. ft. shelf area; 162 ice cubes, 10.6 lbs. ice; 4 ice trays, 2 double-depth; 2″ and 2½″ highest quality insulation; Coldtray for salads, cubes, etc.; no drain pipe.

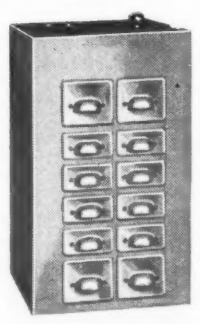
REFRIGERATION

MODEL "W" condensing unit, water cooled; capacity 825 lbs. refrigeration per 24 hrs.; 2 cylinder compressor; ¾-h.p. motor; V-belt drive; safety shut-off. One of 3 water-cooled units for various conditions and capacities.

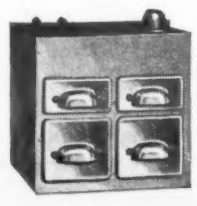
DISPLAY COUNTERS, walk-in boxes, ice cream cabinets, etc., cooled by Copeland refrigerating systems. Valuable assistance given distributors and dealers in making complete or part-equipment sales.

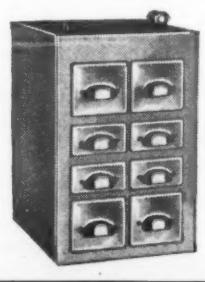


SEPARATE UNITS FOR PRESENT ICE BOXES

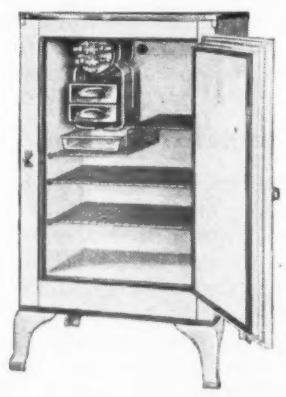


There are ten sizes of cooling units for installation in present ice boxes—capacities ranging from 126 ice cubes (8.2 lbs. ice) to 432 ice cubes (27.8 lbs. ice). These units, with Model "O" condensing unit, will service any size domestic refrigerator.





MULTIPLE FOR APARTMENTS



Copeland manufactures 8 refrigerator cabinets for multiple installation—metal or porcelain lined, with or without legs—which take the standard Copeland 3-M Coil (2 trays; 56 cubes; 4.1 lbs. ice; 8 cu. ft. capacity). Also 7 sizes of cooling coils for boxes up to 25 cu. ft. capacity.

Copeland

FOR THOSE WHO WANT THE FINEST

ELECTRIC REFRIGERATION NEWS

The Business Newspaper of the Refrigeration Industry

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FEBRUARY 27, 1929

Commercial Refrigeration

THREE broad and fairly well-defined divisions in the market for refrigeration equipment are coming to be recognized in the industry: (1) domestic refrigeration—the market for small, automatic units in single homes and apartments. (2) Commercial refrigeration—the market comprising a wide variety of business establishments, particularly retailers of food and perishable commodities, but also including apartment buildings (so classified because of the methods of selling rather than the use of the equipment). Within the commercial market are many applications of specialized equipment such as water coolers, ice cream and beverage cabinets, soda fountains, dairy coolers, display cases, vending machines and others requiring automatic systems. (3) Industrial refrigeration—the market for heavy machinery, mainly in establishments where refrigeration service is an integral part of the business, such as ice making, cold storage and ice cream plants, but also including meat and other food packers, dairy plants, large hotels and apartments, skating rinks, theaters, office buildings, and institutions.

Only a few years ago there was a clean line dividing the manufacturers and distributors of machines for domestic use from those making the heavy industrial equipment. Recently there has been a tendency for the two groups to approach each other. Manufacturers who originally made only the smaller units have gradually increased their line by making larger sizes and have further expanded their market by aggressively selling batteries of machines to customers requiring capacity in excess of their largest automatic unit. Manufacturers of industrial equipment are now meeting the situation by bringing out smaller units. In between the two a new group has sprung up specializing in the intermediate sizes and directing sales effort toward the attractive commercial field. With all groups seeking the apartment business, it is not surprising that this section of the market has been the scene of a most active competition during the past year or two. It also explains why apartments, food stores and food service trades represent a large proportion of the present sales volume.

In this, and in the three previous issues, attention has been called to the detailed problems connected with four important types of commercial refrigeration: the butcher shop (January 16), the grocery store (January 30), the restaurant (February 13) and the florist (February 27—this issue). Following the "New Equipment Number," March 13, the two succeeding issues will also feature commercial applications; namely, ice cream cabinets and soda fountains (March 27), water, milk and beverage coolers (April 10).

While new stores and apartments are continually coming into the market throughout the year, the next two months (March and April) offer the big opportunity for a final clean-up of commercial installations in old buildings. The householder may wait until the hot weather arrives before deciding to make the purchase but a business concern must have its facilities in working order before the heavy summer demand for refrigerated products arrives.

Proper Temperatures for Commercial Coolers

Of special interest to those engaged in developing the commercial refrigeration market is the resolution adopted jointly by the Commercial Refrigerator Manufacturers and the Refrigerating Machinery Manufacturers' Association recommending proper temperatures for commercial refrigerators and coolers used in certain lines of business (See page 1, column 5, also article on page 10). At first glance it appears that the specified temperatures are entirely too high for real food protection. Electric refrigeration salesmen have been talking much lower values. Knowing that their machines can produce temperatures far below the possibilities of ice, they have emphasized this fact by offering very low temperature guarantees to the prospect. While the salesman has been secure in his knowledge of the machine's capacity he may have overlooked the effect of the extreme low temperatures on the refrigerator case. Unless the cabinet has been designed and built to stand these extremes it is quite likely to show the effect of the strain.

As pointed out by the chairman of the committee which drew up the resolution, the length of time during which food must be protected in a given situation really determines the degree of refrigeration necessary for practical purposes. The temperatures specified for the different types of service are based upon the normal length of time perishables are kept as well as the requirements of the particular commodity refrigerated. It is also understood that the figures agreed upon by so many interests naturally represent a compromise. When the resolution is acted upon by the Refrigeration Manufacturers' Council, it is quite possible that this group will demand a lowering of the scale. The electric refrigeration manufacturers have been emphasizing the service of their equipment in giving complete protection. With this background it is doubtful if they will agree to a proposition based on the theory of "good enough" protection. In any event the final figures will be determined by the experience of the user. The principal value of the resolution is to call attention to the fundamental elements in commercial refrigeration and to stimulate study and research in this field.

J. E. STARR DEFENDS A.S.R.E. COMMITTEE'S DECISIONS ON CODE

Disapproves of Stand Taken by Postle & Postle

STARR ENGINEERING CO.
West Street Building, 90 West Street
New York City

February 19th, 1929.

Electric Refrigeration News,
Detroit, Mich.

May I be permitted to say a word or two more in addition to the discussion on the subject of the multiple system, printed in your columns. Dr. Churchill has so thoroughly covered the matter in his letter, appearing in your issue of February 13th, that there seems to be little more that can be said on one side of the discussion, but the wide and possibly irreconcilable positions taken in the premises might be alluded to in the hope that in all fairness, if an agreement cannot be reached, at least a definite statement of the difference may be placed on record and responsibility be fixed.

As I said in my last communication, this is no new subject, but one that was up some thirty years ago, and I supposed was then fairly well settled. The only new feature is that the subject is now complicated by the more general use of refrigerants other than ammonia in small installations and of a different make and character of pipe and fittings. The main question remains practically the same.

Underlying Principles Must Be Agreed Upon First

It appears from a perusal of the communications of an "Outsider" and from the letter of Postle and Postle, both appearing in your issue February 13th, that there are individuals interested in the general subject, who have radically different ideas from others on the fundamental considerations involved. There may be many such, as to many, the subject under discussion is new, or at best not more than four or five years old with only very limited (comparatively) practical examples. No discussion of the subject can lead to any useful conclusions, until the underlying principles are agreed upon.

Messrs. Postle and Postle say: "In our opinion there is no reason whatsoever preventing the safe use of refrigerant in most any quantity required for a large building, in so far as the general type of system is concerned." This conclusion, they say, is the result of experience. May I be permitted to ask: How long an experience? and how many cases? Was it more than five years' experience covering over say, 50 cases, where refrigerant, other than ammonia, was carried in extra heavy pipe? If this conclusoin as to the basic principle is to be accepted, all that can be said of it is, that the work of the A. S. R. E. Code Committee must be disregarded as having no weight, and not entitled to any consideration. The A. S. R. E. code was built around a classification of refrigerating systems on the *basis of weight of refrigerant contained.* Each class is defined by the number of pounds of refrigerant it contains and separate rules made for each class. Class C or the "Small Machine" had practically no restrictions, except what a manufacturer would give it in any event. Class C was allowed 20 lbs. of refrigerant. The general plan of the A. S. R. E. Code and the New York City Code is fully set forth in Dr. Churchill's letter in your issue of February 13th. According to Messrs. Postle and Postle this is a silly and unnecessary classification, and it follows that a single rule, covering material and method of erection and testing, is all that is necessary.

Experienced Men Wrote the Code

Now I have attended the meetings of the A. S. R. E. Code Committee, which has labored on the production of this code for the last several years, meeting sometimes twice a week with sessions often protracted far into the night. The meetings were fully attended by the most prominent and experienced refrigerating engineers in the country, by representatives of the fire department, the underwriters, the gas manufacturers, members of other safety committees and, as Mr. Churchill correctly states, the most competent and experienced engineers in the chemical field and with full advice of the U. S. Bureau of Standards and of the Bureau of Mines. Every phase of the subject was carefully discussed, analyzed and reviewed. Sections were written and rewritten and while an honest and able effort to get the truth was at all times manifest, the interests of the manufacturer was always held prominently in view.

Now it appears that there are some, who claim to know something of the subject, who take the position that this committee did not know what they were talking about, and that their work was not worthy of consideration, and it follows that they consider the whole as not accomplishing the intended purpose.

There is no tinge of commercial favoritism in the A. S. R. E. code, and no discriminating restrictions were for a moment thought of, when it was formed. The code as written was the result of calm, protracted and scientific discussions by a body, composed of the most competent and experienced men in the country and they are not "losing their heads," (as the letter of the American Ice Machine Co. implies) when they are now discussing the subject and are not to be taken as attempting to lay "emphasis" on the supposed hazards.

Why Introduce a Questionable Element?

The men, that the American Ice Machine Co. refers to, believe as do all, who know anything about the subject, that mechanical refrigeration is a safe and efficient way to take up heat in buildings of all classes, when properly and sanely used. As long as such a way exists and has been the common practice in long experience, the writer fails to see why a procedure should be followed, that introduces a questionable element. If an argument is wanted to show that the use of some refrigerants in unlimited quantities in pipe lines, spread throughout any one building, is inadvisable, it can be given. To give out such an argument might do harm to the general industry, as a more or less ignorant public are not likely to discriminate between a safe and an unsafe method, but are more likely to jump at the conclusion, that any method that uses a refrigerating fluid is dangerous.

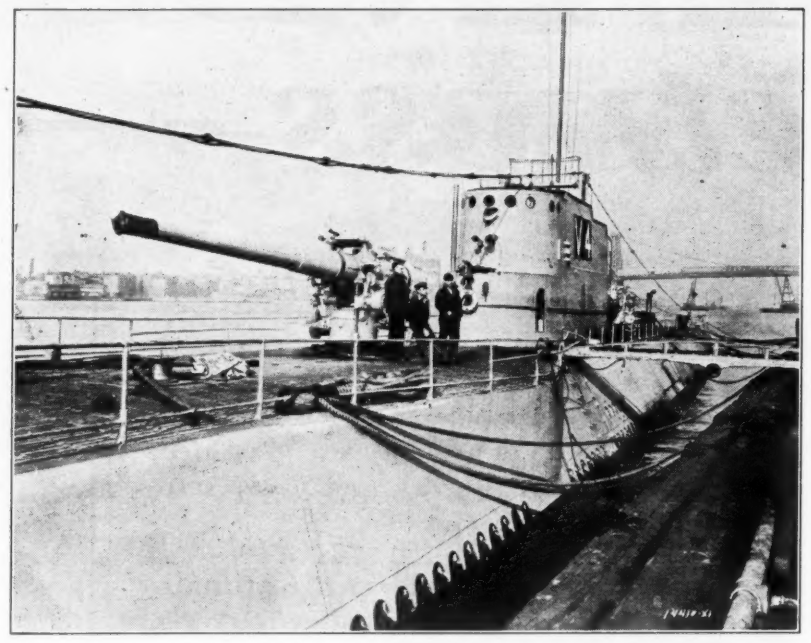
I feel that my position on the subject is a position taken for the best interests of the business of mechanical refrigeration and that the position taken by many of the advocates of the so-called multiple system is not only directly against their own best interests, but against the best interests of the whole industry and that the industry should listen to the voice of competent experience rather than to doubtful advice of inexperienced amateurs.

In this connection I may say that I hardly feel that the position evidenced by Mr. Fremont Wilson in your January 30th issue is a sound one. He seems to think that the multiple system might be allowed, if certain "safeguards" were thrown around it and proceeds to specify what these "safeguards" should be. Maybe they will prove sufficient, but at best it is a guess, and as long as there is a surely safe way, why guess? Mr. Wilson may be as good a guesser as he is a good fellow, but he is such a rattling good fellow, that I doubt it. I fail to see how his provision for a vacuum test has anything to do with the safety feature. Ten or fifteen years ago boxes of domestic refrigerator size were operated by small machines, carrying the refrigerating fluid under a vacuum of about 29.8 inches for months at a time in glass tubes, jointed with rubber hose and dope, but I do not think any refrigerating engineer would advocate their use in a multiple system, because they held this vacuum for so long a time. The other provisions seem equally inadequate, for what hotel keeper, architect (except possibly Postle & Postle) or doctor in a hospital would allow an unlimited amount of refrigerant carried by direct expansion piping all over his building, even if conveyed by extra strong pipe.

There are a few multiple system installations already in existence. They are to be wished good luck, but it will be luck. Sec. 219 of the N. Y. Safety Code is a sane and legitimate protection, and a proper method of carrying heat from above the first floor is open to everybody. The argument against it, that it will cost a little more, is not a good one. A cheap but improper installation is apt to finally prove dear at any cost.

Respectfully,
JOHN E. STARR.

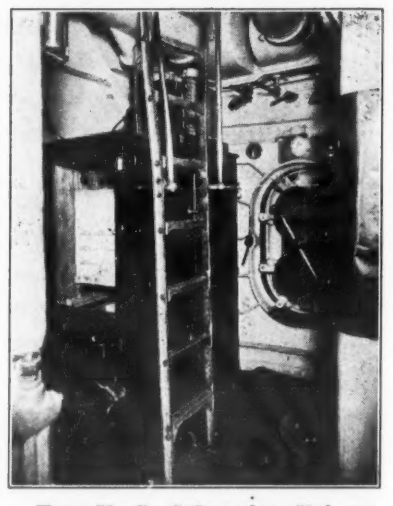
Copeland Goes to Ocean's Floor With U. S. Submarine



Copeland electric refrigeration has just been installed on several U. S. submarines, including the V4, shown here. Eventually 35 submarines of the V, R and O types will be so equipped.

The equipment is operated directly from the ship's dynamo, using a 110-volt direct current which operates a two-cylinder air-cooled condensing unit. The unit is located snugly in the tiny galley of the sub, taking up very little space, yet supplying enough ice to provide cool drinks and keep a large amount of fresh meat and other supplies.

Due to the cramped quarters and the tremendous amount of machinery crowded into such a small space, the interior of a submarine is always hot, particularly when running awash with the Diesels. When submerged, the electric motors are brought into play, and the warm air of the interior condenses, causing a most unpleasant state of dampness. On account of the unpleasant features of submarine operation, the Navy Department "goes the limit" in providing as much comfort as possible for the crews. And it was with this in mind that the Copelands were added.



Top—U. S. Submarine V-4 on which Copeland electric refrigeration has just been installed. Above—Cooling unit in refrigerator with condensing unit on top.

Coming Features

The March 13 issue will be the New Equipment Number. The 1929 lines of electric refrigeration equipment will be illustrated and described in detail. Manufacturers are invited to furnish full information regarding all new products and improvements.

The March 27 issue will feature ice cream cabinets and soda fountains, also store display equipment.

SUGGESTS USE OF SMALL UNITS BY MOVING PICTURE STUDIOS

Electric Refrigeration News,
Detroit, Mich.

I am receiving your publication regularly and I find it most interesting and useful in my line of work.

I am also sending herewith the attached form with your above invoice duly filled with, as required by you; but please note I am not a distributor or dealer in refrigerating machinery, but I am working as a motion picture specialist, and I am a member of the Society of Motion Picture Engineers of America.

The recent advancement in the refrigerating science has made possible "Household-Refrigeration," and it's a boon to other industries also, in which refrigeration on a smaller scale is required. It seems to me clearly now that these smaller units of household refrigerators can easily be used in a small motion picture laboratory, in conjunction with air-conditioning apparatus.

Yours faithfully,
DH. L. MISTRY,
24, Nepean Road, Malabar Hill,
Bombay 6 India.

Kelvinator-Syracuse, Inc., Open New and Larger Home; Changes in Personnel Announced

Kelvinator-Syracuse, Inc., moved into their new building at 1047 West Genesee St., Syracuse, N. Y., Dec. 16. This is the third location of the firm in the three years they have been in business. The growth of the business has necessitated larger quarters.

The company started in a small office and salesroom at 302 W. Genesee St., and later moved to 406 S. Franklin St. When another move seemed necessary it was decided to erect the new building to which they recently moved.

The original personnel has increased from four to thirty persons. The number of machines delivered went from 150 the first year to 3,000 last year.

Coincident with the opening of the new building several changes were made in sales and maintenance personnel. F. A. Piron, former retail sales manager, has been changed to district sales manager of the wholesale division. J. C. Anderson, heretofore assistant to Mr. Piron, will take his place as retail sales manager. Herbert C. Darch will become assistant to Mr. Anderson. C. C. Fairman is director of wholesales sales; William H. O'Brien is in charge of the commercial division; C. B. Warren is service manager, and J. W. Glen is in charge of accounting.

Above—A section of the attractive and spacious new salesroom.
Below—Executives office and general office.

How Electric Refrigeration Is Changing the Status of The Retail Grocery Merchant

Specialty Stores Are Being Replaced by Food Department Stores in Southern California

By Geo. R. Lindahl, General Sales Mgr.,
Commercial Refrigerator Mfg. Co.
Los Angeles, Calif.

PRIOR to the advent of electric refrigeration when people wanted meats they went to a butcher shop. When they wanted groceries they went to the grocery store. When they wanted bakery goods, fruits or delicatessen goods they went to the stores that specialized in these commodities.

The specialty food stores are rapidly being forced out of business. Starting in Southern California about fifteen years ago the grocer added fruits and vegetables, delicatessen and bakery products. About ten years ago he started to add meats. Today about 90% of all the grocers in Southern California maintain a complete food department store. The individual butcher shop has almost completely disappeared. The individual delicatessen is going fast. Outside of a few of the "chain" bakeries it is almost impossible to find the regular old time baker shop.

Idea is Moving Westward

The grocer who starts in business in the Pacific Southwest without a full line of food requirements cannot succeed. The public has been educated into buying all of their food requirements in one place. From present indications this trend is rapidly sweeping eastward and in a short time will be the only method of retail food merchandising employed.

The store fixture companies, the refrigerator manufacturers and the "ice machine companies" were primarily responsible for this change. They learned that as soon as a grocer installed a fresh and smoked meat department that his sales in *groceries* would jump 25% or more within thirty days. People seemed to like the idea of buying all of their food requirements from one store. His fresh meats would stay at a ratio of about 35% of his grocery sales. The delicatessen sales would average 18% of the grocery sales. The bakery sales would average 15% of the grocery sales. Fruits and vegetables would run as high as 25% of the grocery sales.

The salesman for these different companies soon learned the margin of profit possible from each concession. They would go to the grocer (who handled only groceries) and show him how much business he was losing. They would prove to him by other grocers how he could increase his grocery sales. They would show him the ratio of sales of the other concessions to that of groceries. They would prove to him that if he bought their refrigerated fixtures and machines that he could go into these other lines and the EXTRA profit from these lines would make all of the monthly payments of the machines and fixtures and show him a good profit besides. And the strange part of this was that in 95 cases out of a hundred the grocer actually did secure these results.

The main obstacle to making his store a complete food store was in the meat department. If he had a large enough business to warrant hiring a butcher to run the market for him so the meat sales would pay the wages of the meat cutter, monthly payments on the equipment and and operating costs, the grocer would not hesitate. However, there was literally hundreds of these grocers who did not have a sufficient volume of grocery sales to warrant such an increase in operating overhead for the meat department.

Their possible sales in fresh meats would run from $20.00 to $35.00 a day. Some of them tried to put in an ice display case and sell cut meats. This was unsatisfactory. They then tried to operate these cases with a small electric machine. This required an almost constant running time of the compressor, the meats dried out and became dark, and thus unsaleable.

Triple Glass Freezer Adopted

This condition forced the adoption of the "freezer type" of triple glass, well insulated display fixtures. The average grocer soon found that he could keep cut or uncut meats in good condition until he sold them. He found that he could operate the meat department doing a small business at a very nominal cost. A few of the newer electric display cases were so efficient that cut meats could be kept for many days without a noticeable variation in color or without loss in weight. His grocery clerks acted as meat clerks. Hundreds of the small grocers became proficient in meat cutting and bought larger pieces of meat direct from the packer. This brought out the bottom concealed storage, upper display type of electric case. This type of case is what most of the grocers are now buying for their meat department.

The general public have been educated to buying "cut meats." The grocer or one of his clerks does all of the cutting during the dull part of the day. When the rush hour comes no time is spent in cutting to order. Everything is cut ahead that they know by experience what will be asked for by the customer. The grocer then, is in a position to operate at a lower cost per dollar of sales than is a regular butcher shop or retail market. In the southwest he is gradually forcing the regular butcher shop out of business as the retail meat market doing business in the old style way with a long line of single glass cases, big walk-in meat cooler, cutting to order during the rush hour which requires extra labor etc. cannot compete in price with the small grocer.

This method of food merchandising has secured a foothold in Arizona, New Mexico, Texas, Washington and Oregon. It is convenient for the shopping public, lowers retail distribution costs, and is in keeping with the times. The large retail chain stores are also operating their own meat departments and adding meats to stores already established.

The potential sales possibilities of the small electric machine and the efficient triple deck, triple glass display cases for this type of market is enormous. It is without doubt the largest field for the sales of electric refrigeration and is a field that has been overlooked to a great extent by leading equipment and machine manufacturers.

Less than 50 per cent of the homes wired for electricity use any domestic electric appliances except the iron.—*N. E. L. A. Bulletin.*

MARCH TO BE CAMPAIGN MONTH IN SALES PLAN FOR ICE REFRIGERATORS

Ice Refrigerator Month will be launched with a four-color page advertisement in the March 2 issue of the *Saturday Evening Post*. The campaign month ties in with the National Association of Ice Industries' sales plan, "How to Sell Ice Refrigerators."

Copies of this sales plan were sent to members of ice associations. As an aid to those interested in the ice industry a letter is being sent from the National Association of Ice Industries to leading newspapers throughout the country telling them of the campaign. News articles, for release during March, will also be furnished the newspapers.

A mat, reproducing the page advertisement is being furnished ice dealers. In addition to this advertisement five other mats together with related news stories will be furnished.

A special letter for the March Direct-to-Home Campaign will show models of ice refrigerators, lithographed in colors. The front of the letter will duplicate part of the March 2 advertisement.

Illustrations and headline of the *Post* advertisement will be enlarged and lithographed in the four colors to be used as display posters for delivery wagons, in windows, and in salesrooms.

Two 8-page folders will answer questions of the ice industry. One is entitled "The Ice Box Check-Up", and the other "Inside Facts on Outside Icing."

TERM "ICE REFRIGERATOR" WILL REPLACE "ICE BOX"

The term to be applied to household refrigerators cooled with ice was discussed at a meeting of the National Association of Ice Industries, Dec. 10.

A motion was adopted that the term "ice refrigerator" or "refrigerator" should be used in preference to the term "ice box" in all Association advertising matter and literature, but that the term "ice box" may be used in places where it seems preferable.

Former Baseball Star Now Selling G. E. Units in California

Fred C. (Freddie) Snodgress, former member of the New York Giants, is now a General Electric dealer in Oxnard, Calif., and is reported to have one of the finest showrooms in Ventura county.

REFRIGERANTS

Sulphur Dioxide (SO_2), Its Production, Characteristics And Use as a Refrigerant

By Chas. W. Johnston
General Manager, Virginia Smelting Company
West Norfolk, Virginia

THE properties of sulphur dioxide (SO_2) which make it a desirable refrigerant are now so well known that they need be only mentioned in this article. There is, however, a large amount of practical information regarding this refrigerant and its use which has not been published and this article will be devoted largely to such information.

Sulphur dioxide is the gas formed by the burning of sulphur (commonly known as brimstone). This combustion or burning of the sulphur is a chemical union of the sulphur with oxygen of the air. In this reaction one pound of sulphur theoretically unites with one pound of oxygen from the air, making two pounds of sulphur dioxide. In actual manufacturing work considerably less than two pounds of sulphur dioxide are recovered for each pound of sulphur burned.

Sulphur dioxide is also formed by roasting iron pyrites, a mineral composed of iron and sulphur, and it is formed in the operation of smelting ores, where it is a waste product.

The sulphur dioxide used in the United States in the refrigeration field is made from sulphur mined in Louisiana or Texas. This sulphur is a very pure product. When it is burned the gas formed is hardly more than fourteen percent by volume sulphur dioxide. The other eight-six per cent is largely unburned air and nitrogen, but it contains other products in small quantities. This fourteen percent sulphur dioxide must be separated from the gas, purified, dried and then converted to liquid before it can be shipped. This is accomplished by bringing the gas from the sulphur burner in contact with cold water. The sulphur dioxide is taken up by the water. The amount of sulphur dioxide so taken up depends largely on the temperature of the water and the percentage of sulphur dioxide in the gases. A ton of water (about 240 gallons) may take up on the average from twenty to twenty-six pounds sulphur dioxide. This water containing the sulphur dioxide is heated and the sulphur dioxide driven out of the water. The heating is done in a closed vessel, so that the sulphur dioxide driven out of the water is almost 100 percent pure. It does, of course, contain some water and some small amounts of air. This sulphur dioxide gas is cooled, freed from its water in one of several ways, compressed, and after compression, cooled to the temperature at which it becomes a liquid. The pressure to which it is necessary to compress depends largely on the temperature of the cooling water, and probably on the average is 100 pounds per square inch.

SO_2 is One of Purest Chemicals

Manufacturers have developed certain unique practices in their plants, so today liquid sulphur dioxide for refrigeration purposes is one of the purest chemicals made for any purpose. Some of that now being shipped contains as little as eight parts of water per million of sulphur dioxide, that is, .0008 per cent water and no other impurities. Oil, sulphuric acid, dirt, and air are four impurities that might contaminate the sulphur dioxide, were care not used to make sure they are not in the sulphur dioxide as shipped.

Sulphur dioxide is a stable chemical, not easily changed to anything else, hence a product that can be used indefinitely in a refrigeration machine. It is a colorless gas or liquid, not inflammable, and not explosive. It has an irritating effect on the mucous membranes, but it is not poisonous. This irritating effect causes the one so irritated to do the very best thing possible, namely: to get out in the air away from the gas. Recovery from even extreme exposure is rapid when the one who has been exposed gets into the fresh air. Naturally if the membranes of the throat have been badly irritated care should be used not to contract a severe cold. Cases of secondary effects such as bronchitis, or pneumonia, following exposures to strong concentrations of sulphur dioxide are extremely rare. References in medical books to effects of sulphur dioxide should be read with certain very definite facts in mind, otherwise quite erroneous conclusions may be drawn. Tables have been published, showing concentration of sulphur dioxide in the air, that will cause death in a short time, or after an hour. In studying these tables, it should be remembered that no one will breathe such concentration unless he is wholly unable to move himself away from them, on attract anyone to him.

Irritating Effect a Warning

The irritating effect of the gas is a warning, for the irritation makes one get away from the gas, whereas almost every day men are killed by fumes from automobiles, because these fumes do not cause sufficient discomfort to make one get away from them. There is also a statement to the effect that "on the membranes of the nose and throat sulphur dioxide is oxidized to sulphuric acid." If this reaction takes place at all, it is only to a very, very limited extent, and if such little sulphuric acid as may possibly be formed is not immediately destroyed by the alkaline secretions of the mouth, it is so very weak it cannot do any injury as sulphuric acid.

Sulphur dioxide in water forms sulphurous acid, not "sulphuric." Sulphurous acid is a very different acid from sulphuric. Neither sulphur dioxide nor sulphurous acid are easily converted to sulphuric acid. If one gets sulphur dioxide into the eyes, the eyes should be washed immediately with plenty of clean, fresh water.

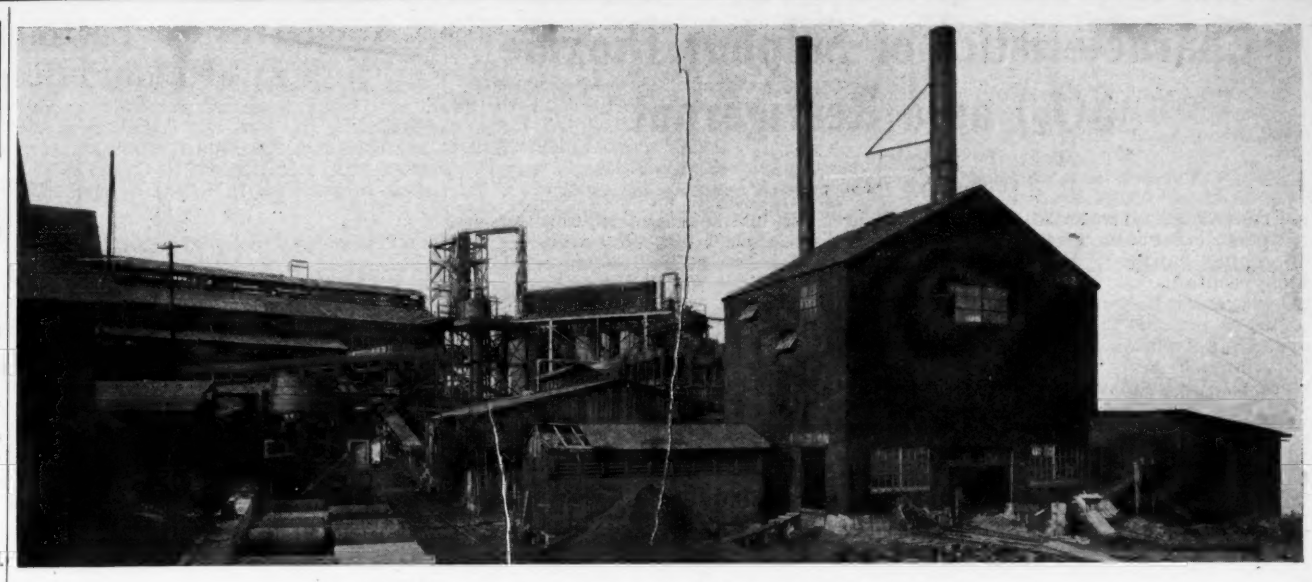
Such sulphur dioxide as that now being used in refrigeration work does not attack the metals used in the systems. Dry sulphur dioxide is quite inert.

In the presence of water sulphurous acid is formed and sulphurous acid does attack metals. While partly responsible for corrosion troubles, wet sulphur dioxide was not to blame for all those troubles. At least three other factors caused some of the trouble. Improper oil for use with sulphur dioxide, air in the system, either left there in charging, or introduced in the liquid sulphur dioxide, and too high temperature of compressor. All these factors are understood today. Their control is simple, and with reasonable care to have these things correct, corrosion trouble is being avoided.

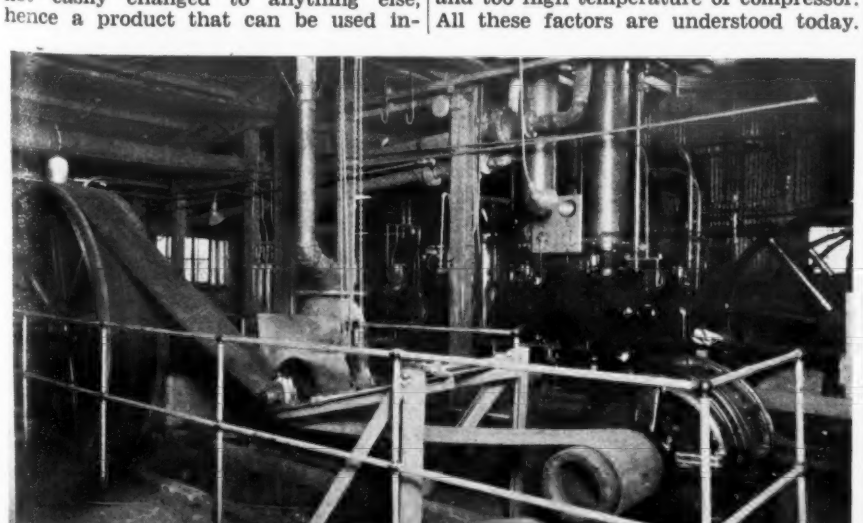
One other point regarding the troubles of the past caused by wet sulphur dioxide is worthy of consideration. When sulphur dioxide containing water is exaporated, part of this water goes along with the SO_2 gas, part remains behind in the liquid SO^2. This liquid sulphur dioxide left after part of it has evaporated may thus have its water content increased to such a point that it will attack metals; whereas, the sulphur dioxide originally charged into the unit will not do so. Suppose that the SO_2 in the receiver flowing to the expansion valve contained .03 percent by weight water, and some of this liquid were allowed to evaporate entirely at some point in the system. As this liquid evaporated, part, but not all, of the water would go off with the gas, so that when all the SO_2 had evaporated, there would actually be a little drop of water left behind.

As liquid sulphur dioxide evaporates, the percentage of water in the unevaporated liquid sulphur dioxide constantly increases, until when very little liquid sulphur dioxide is left, it would have a large percentage of water in it. This fact can clearly be proved by evaporating liquid sulphur dioxide in a test tube or glass tumbler. If the original sulphur dioxide used for the test contains less than .02

(Concluded on page 18)



General View of a Sulphur Dioxide Manufacturing Plant.



Compressor room at the Virginia Smelting Co. plant.

MAKES SERVICE MEN AVAILABLE THROUGH PHYSICIANS EXCHANGE

C. L. Kennedy, Kelvinator distributor in St. Joseph, Mo., has made arrangements with the physicians and surgeons telephone exchange for handling service calls during evenings and on holidays and Sundays. In this way the serviceman informs the exchange of his whereabouts and in the event of a call he can be easily located.

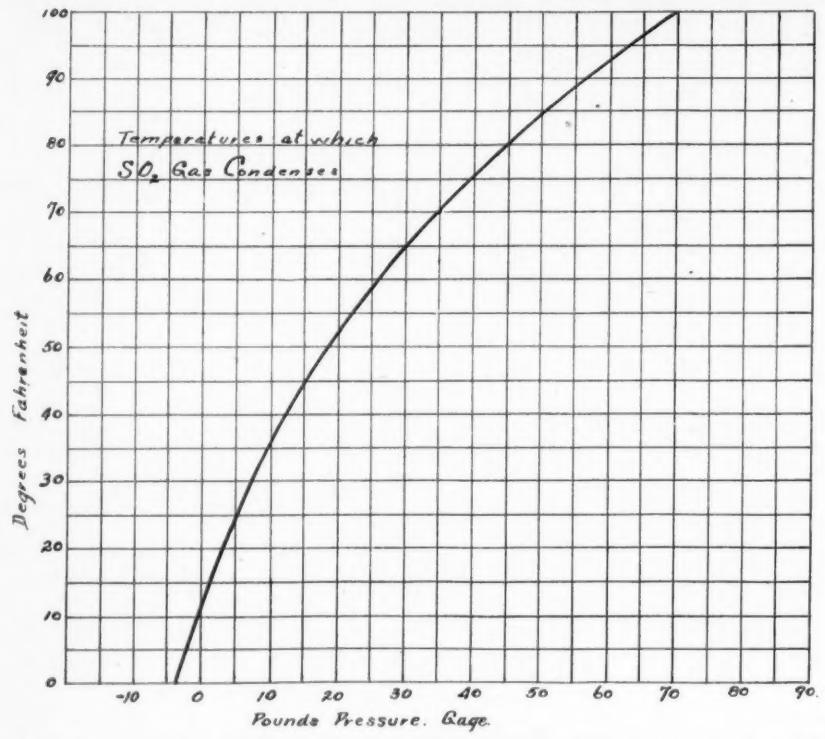
Characteristics of Sulphur Dioxide (SO_2) as a Refrigerant

(Concluded from page 17)

per cent water, no water will be visible in the glass. (See table given under testing of sulphur dioxide.) As sulphur dioxide today contains not over .0025 per cent, this concentration of the water does not occur, as perhaps it did some years ago.

Testing for leaks of sulphur is simple, as ammonia and sulphur dioxide gas gives a white solid easily noted and usually referred to as "smoke."

The pressures and temperature at which sulphur dioxide gas condenses into a liquid are shown on the following curve:



Curve indicating the effect of various pressures upon the temperatures at which sulphur dioxide gas will condense.

These temperatures and pressures are very suitable ones at which to operate refrigerating units, and are such that containers in which the liquid is shipped may be absolutely safe, yet not too heavy. One very important point should be most carefully considered by all handling or filling cylinders. (This observation, of course, applies to all liquefied gases.) No cylinders should ever be completely filled with liquid sulphur dioxide, but there should always be space that contains gaseous sulphur dioxide. When such condition is fulfilled, the pressure in the container will be that corresponding to the temperature as shown on the above curve. Should a cylinder be in a fire, the safety fusible plug will melt before pressures become too great. The rule that containers must not be filled with more than 1.25 pounds of sulphur dioxide for each pound of water they will hold assures that there will always be a gas space in the container.

Liquid sulphur dioxide expands when heated. If there is no space left in the cylinder for this expanded liquid, it will exert a pressure and this hydraulic pressure can easily become very great, so great that it may burst any of the containers. The following table shows the space occupied by liquid sulphur dioxide at various temperatures:

Cubic Inches Occupied by Ten Pounds of Liquid SO_2 at Various Temperatures

Degrees Fahrenheit.	*Cubic Inches.*
0°	187
20°	191
40°	195
60°	199
80°	203
100°	208
120°	214

Note—From the above table it is clear that the expansion of liquid SO^2 on heating from 0° to 120° Fahrenheit is such that at 120° the liquid fills fourteen percent greater space than at 0°.

Because of the above facts, it is most wise for those who may be filling containers with liquefied gas to know absolutely the water content of these containers, their empty weights, the maximum weights of liquefied gas that may be safely put into them, and then to weigh this gas into them, or where this is absolutely impossible, to weigh containers immediately after charging, deducting from this the empty weight of cylinder to be sure cylinder has not been filled too full.

To sum up the properties that make sulphur dioxide a desirable refrigerant, it may be said that its operating pressures and latent heat of vaporization are very favorable; it is not explosive, and not inflammable; lubrication problems are not difficult ones, and leaks may be easily detected. As now obtainable, sulphur dioxide is pure, so does not attack metals of which units are made; it is not poisonous, and its irritating effects tend to warn of leaks and impel those exposed to seek the fresh air. In addition to these desirable qualities, sulphur dioxide is a cheap product now made by a number of reputable firms, who have a capacity capable of producing probably twice the present total consumption of this country. Sulphur dioxide is used in many fields besides that of refrigeration, hence the refrigeration users have the advantage of lower costs made possible by the larger production for general use, and are not dependent alone on what the refrigeration industry can use. Manufacturers now carry stocks in a number of cities so that besides the place where SO^2 plants are located, sulphur dioxide can be obtained from stocks located in New York, Boston, Montreal, Toronto, Detroit, Cincinnati, Chicago, St. Louis, Denver, San Francisco, and Los Angeles, and probably ere long from many other points. The sulphur dioxide in these stocks has all been analyzed, but buyers can quite easily check their purchases by evaporating a quantity in a small test tube. The best sulphur dioxide on evaporation in such a tube will show absolutely nothing left in the tube. For determining total water where some is left in the tube, the following table can be used:

Table for Determining the Percentage of Moisture

Table for determining the percentage of moisture in SO^2 by evaporation of 100 c. c. (149 grams) of liquid sulphur dioxide in a moisture tube and noting the amount of water left in the tube. (If the SO^2 to be tested contains less than .02 per cent water, this method cannot be used because no water that can be noted will be left in the tube when a sample contains less than .02 per cent water.)

A	B	C
.000	.030	.020
.005	.033	.025
.010	.035	.030
.015	.036	.034
.020	.038	.038
.03	.039	.046
.04	.041	.054
.05	.042	.062

A—Cubic centimeters of water, that is, grams of water left in the tube.

B—Weight of water that will go off from tube with the SO^2 gas.

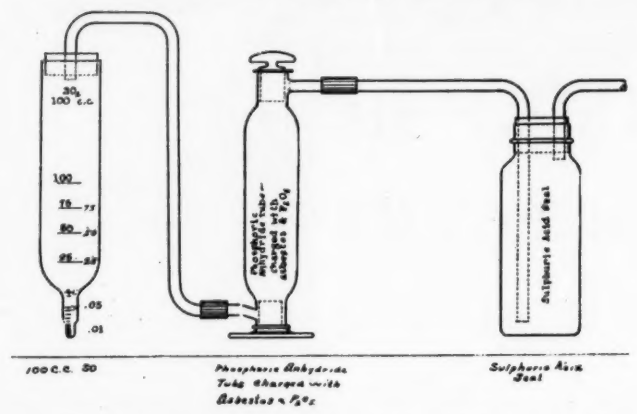
C—Total percent of water by weight in the sample of SO^2 tested; this equals A plus B divided by weight of the sample, 149 grams.

Care must be exercised in drawing the sample into the tube, otherwise water will be picked up by the sample from the air. Details as to more elaborate, accurate tests for moisture and inerts can be had from some of the manufacturers who are always glad to co-operate in every way with those who have problems on sulphur dioxide.

Some Figures on Sulphur Dioxide

Critical temperature	314.82	degrees F.
Critical pressure	1141.5	lbs. per square inch absolute
Specific heat of SO_2 gas constant pressure	.1511	
Specific heat of SO_2 liquid at 50° F.	.35	
Latent heat of vaporization at atmospheric pressure	167.1	B. T. U. per lb. SO_2
Weight of 1 cu. ft. liquid SO_2 at 32° F.	89.7	lbs.
Weight of 1 cu. ft. liquid SO_2 at 90° F.	84.4	lbs.
Weight of 1 cu. ft. gaseous SO_2 at 32° F. and atmospheric pressure (sea level)	.1827	lbs.

Apparatus for Testing the Moisture Content of Liquid Sulphur Dioxide



Moisture tube and phosphorous pentoxide tube used for determining the moisture in liquid sulphur dioxide. The sulphuric acid bottle serves as seal. The SO_2 gas passing out of this bottle is led out of doors. The tube at the left may be used in connection with the moisture percentage table in column 2, thus avoiding the necessity of using the phosphorous pentoxide tube also.

N. E. M. A. BOARD HOLDS MEETING IN NEW YORK

The Board of Governors of the National Electrical Manufacturers Association met in New York City, Jan. 23 to 25, at the Hotel Commodore and at N. E. M. A. headquarters.

Huntington B. Crouse, president, gave the welcoming address in which he emphasized some of the constructive trends in modern business and cited the industry trade practice conference as an established medium through which an industry can govern itself in accordance with a formulated code of ethics.

Thomas Allen, chairman of the organization tariff committee, gave an abstract of a brief which has been submitted to the House Ways and Means committee. The brief states that the association is in favor of the American Valuation Plan.

The plan of the Committee on Electrical Leagues, which calls for the establishing of a common fund for the support of local leagues was outlined by S. L. Nicholson.

W. E. Sprackling, vice president, in charge of the supply division, urged members to give detailed attention to the subject of industry trade practice conferences.

Frigidaire Man to Assist in Staging Pacific Exposition

Grant Fink, manager of the Seattle office of Frigidaire, has been appointed to the general committee to arrange for the 1929 Pacific Northwest Merchants' and Maritime Exposition which will be held during the week of July 29-Aug. 3.

REFRIGERANTS

(Continued)

Chemical Values of Methyl Chloride (CH_3Cl) Described; Tables of Comparative Data

By Thomas Coyle, Service Engineer
The Roessler & Hasslacher Chemical Co.
Niagara Falls, N. Y.

METHYL CHLORIDE is a non-corrosive liquefiable gas. It was discovered in 1835 by Dumas and Peligot and although manufactured in Europe in small quantities since about 1875, it was not available in quantity in this country until 1920 when its manufacture was started by the Roessler & Hasslacher Chemical Company.

The properties of methyl chloride are such that it is especially suitable for use in refrigerating plants on ships, in hotels, apartment houses, restaurants, ice cream cabinets, drinking water coolers, household units, and in absorption units.

Briefly, the advantages of methyl chloride as a refrigerant are:

1. It is practically as non-corrosive as carbon dioxide.
2. It does not form explosive mixtures with air under ordinary conditions of operation.
3. Its head pressure is lower than that of ammonia.
4. Its operating efficiency is nearly equal to that of ammonia.
5. Small quantities of methyl chloride in air do not produce noxious or dangerous conditions.

Physical Properties
Chemical Formula, CH_3Cl

Color—Methyl chloride is colorless and transparent in both the gaseous and the liquid state.

Odor—Faintly sweet, ethereal odor. Does not irritate eyes or lungs.

Melting Point, –144°F or –97.6°C.

Boiling Point, –10.65°F or –23.7°C. This temperature is for a barometric pressure of 760 mm.; for other barometric pressures the boiling point falls by approximately 0.031°C for each mm. by which the barometer stands below 760 mm. Thus, for a barometric pressnure of 750 mm. the boiling point of pure methyl chloride is –23.7° – (10 x 0.31) = – 24°C.

Density—The specific gravity (referred to water at 4°C) is 1.00 at –10.65°F or –23.7C., the boiling point of methyl chloride; 0.92 at 68°F or 20°C; 0.80 at 158°F or 70°C. (Melting point of fusible plug on methyl chloride shipping containers.)

Critical Temperature, 289°F or 143°C.

Critical Pressure, 970 lbs. per sq. in. absolute.

Density of Gas (air = 1.0)
1.78 at 32°F and atmospheric pressure.

Specific Heat, Cp = 0.24, Cv = 0.20, Cp/Cv = 1.20.

Latent Heat of vaporization of liquid. See Table III.

Solubility—One volume of water dissolves three to four volumes of methyl chloride at ordinary temperatures and atmospheric pressure. It is readily soluble in alcohol, chloroform, etc.

Methyl Chloride—Specifications and Tests

1. *Color*—The liquid should be colorless and free from cloudiness.
2. *Odor*—It should have a characteristic ethereal odor, faintly sweet. It should have no foreign or noxious odor.
3. *Moisture*—Upon evaporation of a sample of 200 grams in a dry narrow neck or Erlenmeyer flask, no crystals of ice should be formed in the liquid up to the point of complete evaporation of the Methyl Chloride. A small watch glass placed over the mouth of the flask during evaporation will prevent contamination. The temperature of the evaporating liquid will be the boiling point of the methyl chloride. Maximum water content will not exceed 0.026% provided no ice is formed during evaporation. (If the refrigerating system is not thoroughly dried before charging methyl chloride, there may be an accumulation of moisture in the system which is often eliminated by the permanent installation of a calcium chloride drying tube between the condenser or receiver and expansion valve.)
4. *Residue*—Evaporation of a sample of methyl chloride in an Erlenmeyer flask as under 3 above should give a residue not to exceed 0.15% by weight.
5. *Acidity*—Acidity should not exceed 0.001% calculated as HCl.
6. *Boiling Point*—Should lie in the range between –23.5 and –24.5°C at 760 mm.

Physiological Properties

The Roessler & Hasslacher Chemical Company has been interested in methyl chloride for nearly fifteen years. During this period many technical men and other employees have handled methyl chloride under various conditions incidental to experimentation and extensive large scale production. No trouble of a serious nature due to physiological properties of methyl chloride has ever been experienced. One or two men, due to carelessness on their part, were exposed to excessive concentrations of methyl chloride and suffered an attack similar to alcohol intoxication. These men recovered completely in a short time and apparently suffered no after effects whatever. Many of the employees of this company have worked continuously for many months with methyl chloride, but not a single case has been observed that would indicate that methyl chloride has a cumulative physiological effect on the human system.

Flammability

The conclusion reached by the Underwriters' Laboratories after a study of the "Fire Hazard of Methyl Chloride as a Refrigerant" is that: "Methyl chloride is a moderately flammable refrigerant." They also state that: "The apparent ignition temperature of methyl chloride was found to be 632°C. (1169.5°F.).

If methyl chloride in glass beaker is ignited it will burn feebly and require frequent relighting before the material is consumed. Another example of the relative difficulty of burning methyl chloride is this: If the valve of a cylinder of methyl chloride is opened slightly, the issuing vapor can be lighted, but if the valve then is opened a trifle wider, the flame instantly goes out.

Possibility of Explosion

The conclusion of the Underwriters' Laboratories in the report previously mentioned, is "The explosion hazard of methyl chloride is moderate."

There is no possibility of explosion within a refrigeration system using methyl chloride as a refrigerant for the simple reason that to draw sufficient air into the system to produce an explosive mixture would cause such excessive pressure, that the machine would cease operation long before enough air would be drawn in to make an explosion possible. Also, since at all operating temperatures in a refrigeration system, methyl chloride is a very stable substance, there is no danger that hydrogen or other highly flammable substances will develop and form explosive mixtures.

As mixtures of methyl chloride and air in certain proportions are flammable, it is wise to consider the possibility of the formation of explosive mixtures outside of the refrigerator in the event of a serious leak in the refrigeration system.

According to the Underwriters' Laboratories, methyl chloride forms explosive mixtures with air when the concentration by volume of the methyl chloride is between 8.1% and 17.2% of the mixture. One pound of liquid methyl chloride will produce at room temperature and pressure about 7.5 cubic feet of gas. Therefore, one pound will render a total volume of 92 cubic feet of a mixture of methyl chloride and air inflammable.

Behavior Towards Heat

Methyl chloride is very stable at elevated temperatures. Berthelot states that when methyl chloride is passed over pumice at dull red heat, it decomposes to a very slight extent (air or oxygen excluded), while at bright red heat it breaks down into hydrochloric acid, methane, hydrogen, etc. Professor H. J. Macintire gives the following result of work done on the decomposition temperature of methyl chloride in the presence of metals.

°F	CC. of 0.1006 N KOH to produce a red color with phenolphthalein
165	0.01
210	0.01
30	0.01
390	0.01
480	0.01
660	0.01
750	0.01
795	0.03
795	0.04
840	0.41
840	0.42
885	1.25
885	1.27
930	2.85
930	2.95
930	2.90

Methyl chloride can be used with the common metals, having in this respect a great advantage over ammonia. The hydrolysis of methyl chloride in the presence of water is negligible and there is no appreciable corrosion in containers or refrigeration equipment due to its use. The presence of moisture will not cause corrosion as it will in the case of some other refrigerants but at low temperature the water will separate out in solid form.

We quote here experiments performed by Professor H. J. Macintire on the weight changes in metals treated separately with methyl chloride:

The consumer should use only a miner-

(Concluded on page 20)

Weight Changes in Metals Treated Separately in Methyl Chloride

Metal	Wt. in g. of sample	Wt. in g. of sample after heating with CH_3Cl	Change in g.	Appearance
Copper	0.7081	0.7083	+0.0002	Unchanged
Solder	1.8827	1.8829	+0.0002	Surface slightly dulled
Galvanized Iron	1.5375	1.5380	+0.0005	Ungalvanized surface darkened
Cast Iron	1.3068	1.3075	+0.0007	Surface darkened
Cylinder Bronze	1.4684	1.4684	– – –	Unchanged
Forged brass	1.6651	1.6653	+0.0002	Unchanged

Weight Changes in Metals Heated in Contact with Each Other with Methyl Chloride and Lubricating Oil

Metal	Wt. in g. of sample (previously used)	Wt. in g. of sample after treatment	Wt. in g. of sample (not previously used)	Wt. in g. of sample after Treatment
Copper	0.7083	0.7083	0.7294	0.7295
Solder	1.8829	1.8829	1.7363	1.7364
Galvanized Iron	1.5380	1.5380	1.3598	1.3595
Cast Iron	1.3075	1.3075	1.2944	1.2940
Cylinder Bronze	1.4684	1.4682	1.7546	1.7546
Forged Brass	1.6653	1.6651	1.5356	1.5356

Weight Changes in Metals Heated in Contact with Each Other in Lubricating Oil

Metal	Wt. in g. of sample	Wt. in g. of sample after heating in oil
Copper	0.7261	0.7260
Solder	1.6248	1.6248
Galvanized Iron	1.3076	1.3075
Cast Iron	1.2689	1.2683
Cylinder Bronze	1.7220	1.7220
Forged Brass	1.4712	1.4713

Table I

The following table shows the power (H.P.) required to produce one ton of refrigeration at various indicated condenser temperatures and pressures of methyl chloride.

Suction Pressure Lbs. Gage	Temperature Deg. F.	28.9 41° F.	36.9 50° F.	45.8 59° F.	56.3 68° F.	67.8 77° F.	80.8 86° F.	95.4 95° F.	111.5 104° F.
28.9	41	.....	0.089	0.176	0.275	0.375	0.474	0.584	0.695
21.9	32	0.087	0.182	0.277	0.377	0.484	0.600	0.708	0.830
15.9	23	0.182	0.280	0.383	0.490	0.603	0.721	0.846	0.972
10.7	14	0.282	0.395	0.499	0.614	0.736	0.861	0.998	1.13
6.2	5	0.399	0.510	0.623	0.748	0.881	1.01	1.15	1.30
2.4	—4	0.521	0.637	0.762	0.897	1.02	1.15	1.30	1.45
—0.9	—13	0.652	0.779	0.908	1.06	1.21	1.35	1.52	1.69
—3.6	—22	0.800	0.935	1.08	1.23	1.39	1.55	1.73	1.93
—5.9	—31	0.942	1.10	1.25	1.41	1.58	1.77	1.95	2.16
—7.74	—40	1.12	1.28	1.44	1.62	1.81	2.02	2.26	2.42

(The actual horse power required will probably be 50% to 60% greater than that shown in the above table, depending on the type of machine, drive, etc.)

Table II

Table II shows the volume of methyl chloride gas to be handled for one ton of refrigeration in cubic feet per minute.

Suction Pressure Lbs. Gage	Temperature Deg. F.	28.9 41° F.	36.9 50° F.	45.8 59° F.	56.3 68° F.	67.8 77° F.	80.8 86° F.	95.4 95° F.	111.5 104° F
28.9	41	.....	2.69	2.76	2.83	2.91	2.99	3.08	3.16
21.9	32	3.14	3.22	3.32	3.40	3.49	3.59	3.68	3.80
15.9	23	3.78	3.88	3.98	4.08	4.20	4.32	4.45	4.57
10.7	14	4.61	4.73	4.85	4.98	5.13	5.28	5.44	5.60
6.2	5	5.60	5.75	5.90	6.08	6.26	6.45	6.63	6.83
2.4	—4	6.90	7.09	7.28	7.49	7.71	7.94	8.19	8.45
—0.9	—13	8.57	8.80	9.06	9.35	9.63	9.90	10.21	10.53
—3.6	—22	10.71	11.02	11.35	11.70	12.05	12.44	12.83	13.28
—5.9	—31	13.42	13.92	14.32	14.78	15.25	15.78	16.28	16.85
—7.7	—40	17.29	17.80	18.38	18.94	19.56	20.23	20.90	21.65

Table III

Thermal and Density Data.

This table represents the result of a careful study of the data on methyl chloride appearing in literature. The values given in general follow those of Holst.

Temperature °C.	Temperature °F.	Pressure Lbs. Per Sq. In. Gauge	Pressure Lbs. Per Sq. In. Abs.	Heat—BTU per lb. Liquid Above —40°	Heat—BTU per lb. Vaporization	Heat—BTU per lb. Total Heat of Vapor	Liquid Cu. Ft. Per Lb.	Liquid Lbs. Per Cu. Ft.	Vapor Cu. Ft. Per Lb.	Vapor Cu. Ft. Lbs. Per
	t		P	q	r	H=r+q			V	1/V
40	104	111.56	126.26	67.2	157.8	225.0	.01833	54.56	0.818	1.2225
35	95	95.40	110.10	63.0	160.5	223.5	.01811	55.22	0.937	1.0667
30	86	80.83	95.53	59.0	162.9	221.9	.01793	55.77	1.075	0.9302
25	77	67.83	82.53	54.8	165.2	220.0	.01771	56.46	1.238	0.8078
20	68	56.30	71.00	50.6	167.3	217.9	.01753	57.05	1.432	0.6983
15	59	45.80	60.50	46.4	169.3	215.7	.01733	57.70	1.664	0.6010
10	50	36.90	51.60	42.2	171.1	213.3	.01716	58.15	1.939	0.5157
+5	41	28.90	43.60	37.9	172.9	210.8	.01698	58.89	2.274	0.4397
0	32	21.93	36.63	33.7	174.6	208.3	.01681	59.49	2.678	0.3734
–5	23	15.90	30.60	29.5	176.1	205.6	.01665	60.06	3.170	0.3155
–10	14	10.68	25.38	25.3	177.3	202.8	.01650	60.61	3.798	0.2633
–15	+5	6.19	20.89	21.1	178.5	199.8	.01634	61.20	4.530	0.2208
–20	–4	+2.37	17.07	16.9	179.9	196.8	.01619	61.76	5.470	0.1828
–25	–13	–0.88	13.82	12.7	180.8	193.5	.01602	62.42	6.660	0.1502
–30	–22	–3.59	11.11	8.5	181.7	190.2	.01590	62.89	8.160	0.1226
–35	–31	–5.86	8.84	4.2	182.6	186.8	.01576	63.45	10.075	0.0992
–40	–40	–7.74	6.96	0	183.3	183.3	.01564	63.98	12.580	0.0795

Table IV

Properties of Refrigerants

This table compares the physical data of the common refrigerants used such as carbon dioxide, ammonia, methyl chloride, sulphur dioxide and ethyl chloride.

Refrigerant	Carbon Dioxide	Ammonia	Methyl Chloride	Sulphur Dioxide	Ethyl Chloride
Chemical Formula	CO_2	NH_3	CH_3Cl	SO_2	C_2H_5Cl
Odor	None	Pungent Suffocating	Slightly sweet Ethereal	Pungent Suffocating	Similar to Methyl Chloride
Critical Temperature °F.	88.2	266	289	311	360.5
Critical Pressure, lbs. absolute	1073	1690	970	1160	784
Density—Liquid	1.56 at 32°F.	0.623 at 32°F.	0.999 at —13°F.	1.434 at 32°F.	0.9214 at 32°F.
Density—Gas at 32°F. and atmospheric pressure (Air—1)	1.528	0.596	1.782	2.264	2.31 Calculated
Weight (lbs.) one cu ft. gas at 32°F. and atmospheric pressure	0.1233	0.0481	0.1438	0.1827	0.1864
Boiling point at atmospheric pressure, °F.	—110.0 Sublimes	—27.4	—10.65	+14.0	+54.5
Comparative volume displacement per unit of refrigeration	1.0	5.77	11.6	15.1	37.0

Frigidaire Leases Dayton Warehouse

Frigidaire Corp., Dayton, Ohio, has leased one of the buildings of the Dayton Scale Co. plant, located on East First St., Dayton.

The structure is a one-story building having an area of 25,000 sq. fr. and is served by a railroad siding. The building will be used for warehouse purposes.

Description of the Chemical Values of Methyl Chloride (CH_3Cl)

(*Concluded from Page* 19)

al oil with methyl chloride that has been recommended by the manufacturer of the unit in use.

Two classes of lubricants have been used for methyl chloride refrigerators. Lubricants of one class are soluble in methyl chloride, those of the other class are insoluble. Glycerine is practically insoluble in methyl chloride and has a higher specific gravity, so that a mixture of the two liquids readily separates into two layers (glycerine forming the lower layer). Also, glycerine has good lubricating properties but unfortunately it absorbs moisture up to 50% of its own weight so that it cannot be used unless carefully protected from moisture. Another objection to glycerine as a lubricant is that it sometimes has been a cause of corrosion. It is probable that the corrosion was caused by impurities in the glycerine. Because of these objections glycerine has been almost entirely replaced by mineral oils for lubricating methyl chloride refrigerating machines. *We recommend only the use of a suitable mineral oil for use with methyl chloride.*

Although mineral oils are soluble in methyl chloride in all proportions, nevertheless actual practice has shown that many of these oils are very efficient lubricants. The methyl chloride in the compressor at the compressor temperature and pressure does not sufficiently dilute the oil to reduce materially the lubricating efficiency of the oil.

Professor Macintire has done considerable work on the effect of methyl chloride on the viscosity of lubricating oil which is given herewith (Viscosity of oil used was 476 seconds Saybolt).

°F.	Time for flow of oil Seconds	Time for flow of oil-methyl chloride solution—seconds
32	136.5	39
32	130	40
77	32	26
77	31	27
122	14	8.5
122	13.5	8.5
167	11	8
167	11	8.5

Some of the oils that have given good results as lubricants in methyl chloride refrigerators conform to the following tests: Flash point 350 to 400°F; cold test 0 to —20° F; low sulphur content (as near 0 as possible); no saponifiable matter; viscosity 150 to 300 seconds Saybolt at 100°F. We have found that particularly where higher head pressures are maintained, and consequently higher temperatures, the more highly refined oils such as the white oils are the more satisfactory.

Containers

Methyl chloride may be secured from the manufacturer in 10 lb. sample cylinders and also in larger quantities in 60 lb., 90 lb., and 130 lb. cylinders, also in multi-unit tank cars containing 15 tanks each of 120 lbs. net methyl chloride capacity totalling 18,000 lbs. to the car. Cylinders may be shipped in car lot or less than car lot quantities, by freight, or by express. The car lot takes the fourth class or a minimum weight of 30,000 lbs. Empty cylinders returned in car lot take the fifth class rate with a minimum car weight of 36,000 lbs. Empty cylinders returned less than car lot are shipped as fourth class.

The tanks may be removed from the multi unit car by the consumer and conveyed by hand-truck to convenient locations where desired. The empty tanks are then replaced on the car, secured in position, and returned to the manfacturer. This car enjoys the privileges of a tank car and freight is paid on the methyl chloride only.

Single unit tank cars of the Class 105 (I.C.C. Specification) type may also be used for transporting methyl chloride. 19,500 pounds of methyl chloride are transported per car and freight is paid only on the lading.

Gasket

Rubber should never be used as gasket material in connection with methyl chloride as it is soluble in the liquid or vapor. Specially prepared asbestos or chemical lead is suitable for this purpose. pose.

Leak Detection

With the improvement in engineering and servicing methods now enjoyed by the small unit refrigeration field, there has come a decided improvement in the method of making joints. The soap and water method generally in vogue for detecting leaks is meeting with satisfaction. The method is to apply a thin film of soap suds with a brush to the point under examination. The leak is detected by the formation of bubbles around the leak.

For shop service, the electric spark method has been found to be also very satisfactory. This method consists of a spark generated by means of a transformer coil and dry battery set with the exploring needle attached to one terminal of the set and provided with a pad saturated with aqua ammonia. The needle is passed over the suspected area of leaks. The escape of methyl chloride even in small quantities will be evidenced by the formation of a white fog.

Method of Transferring From Cylinders

We recommend that the service cylinder, after having been carefully examined for moisture or other foreign matter, should be weighed and the methyl chloride transferred in the usual manner by inverting the transport cylinder on a saddle or any convenient means of rest so that the methyl chloride may be transferred by gravity to the service cylinder. Extreme care should be had that the service cylinder is not overloaded as these cylinders are designed only for stated amounts. Methyl chloride or any other refrigerant should never be transfered from one container to another by guess.

When transferring methyl chloride from the service cylinder, it is a practice of some to plunge the cylinder into water very near the boiling point or some cases have been known where naked flames have been applied to the service cylinders. *Cylinders should never be plunged into extremely hot water or be exposed to naked flames.*

It is a safe rule to always see that the valve of the service cylinder and the receiving cylinder are opened before any external heat is applied to the service cylinder and this heat should not exceed that which would make the cylinder uncomfortable to the naked hand.

Summary

On the basis of information discussed in the preceding chapters it can be said that methyl chloride ranks today as the best refrigerant available for units such as household refrigerators, multiple installations, and other commercial units for small scale production. It does not corrode metals, is not malodorous, does not irritate the eyes and lungs, and in reasonably small quantities has no serious physiological effect. Methyl chloride is inflammable with difficulty and although methyl chloride has been used abroad for more than 30 years and in the United States for more than 5 years on a large scale as a refrigerant, we have no record of a single serious fire or explosion resulting from its use.

Common Refrigerants Pressure Temperature Curves

AUTOMOBILE INDUSTRY AIDED DEVELOPMENT OF COMPRESSOR V-BELT

The V-shape rubber-fabric belt now generally used on the compressor drive of electric refrigerators is the outgrowth and development of the V-shape fan belt used on automobiles. "Globelt" (Globe Belt), was first made by the Globe Rubber & Tire Co., Inc., Trenton, N. J. for the automobile industry. Later the electric refrigeration and washing machine industries adopted very largely this belt for their conditions.

Some of the early manufacturers of electric refrigerators, used temporarily, an automobile fan belt. The Globe Co. has made improvements in the V-shape belt, the most recent being the new cord, and tape binder reinforced construction.

AMERICAN SODA FOUNTAIN CO. OFFERS FLORIST CASES

Florist cases are manufactured by the American Soda Fountain Co. of Watertown, Mass., and are offered either in mahoganized birch with an 8-inch pink or white marble base molding, or wood faced throughout with marble trimmed with onyx. They are fitted with double glass panels at each end with the doors consisting of a wooden frame with double glass panels. The cases are insulated with cork and lined with white enameled iron. Two wire shelves on adjustable brackets are included in the equipment. These cases are built for either sulphur dioxide or ammonia refrigeration.

The one shown here was built especially for the Carolina Hotel at Pinehurst, North Carolina. It is refrigerated by a Frigidaire system, and is provided with electric light fixtures inside the case. When these are lighted the contents of the case, as well as the triangular-shaped piece of onyx over the door, are illuminated, giving an attractive appearance.

Apartment at Grand Island, Nebr. to be Equipped With Frigidaires

Lee Huff, president of the Nebraska Buick Auto Co. is constructing an apartment building at Grand Island, 150 miles west of Omaha. This building which will contain 28 apartments will be equipped with Frigidaires. All boxes will have a capacity of five cubic feet.

Hartford Concern Formed to Sell Electric Refrigerators

The Refrigerator Sales Corp., Hartford, Conn., has been incorporated to deal in electric refrigerators. Incorporators of the new concern are W. R. Gunberg, S. I. Ward, H. J. Marks and A. J. Marks, all of West Hartford, Conn.

Chicago Florist Equips Shops With Carbon Dioxide Systems

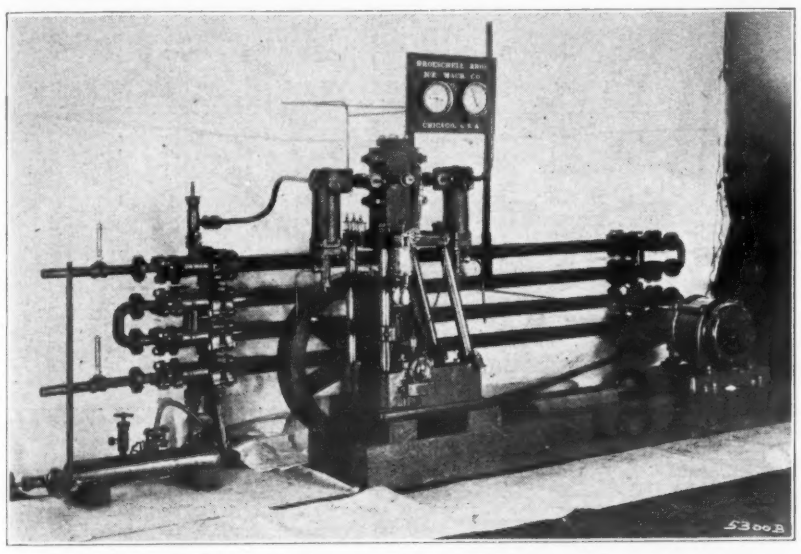
Flowers are Unaffected by this Gas Should Any Leakage Occur

By Lucina E. Judd

HOW best to preserve their delicate stock is a question which always confronts the man whose business is the handling of flowers and plants for profit. The modern florist has come to realize the absolute necessity of finding a better way of solving this vital problem than has hitherto existed, for at best his product is highly perishable.

He has learned by experience that this may better be accomplished if he is able to maintain an even and a correct temperature in both the storage and display refrigerators. This in turn he found could better be secured by electric refrigeration, because with this it is always possible to obtain and maintain just the degree of cold best suited to both flowers and foliage of all kinds.

In arriving at a decision as to which type of refrigerant was best for use in their chain of flower shops—George Wienhoeber Inc. of Chicago—decided on the Brunswick-Kroeschell carbonic anhydride system of refrigeration—a system widely known in the horticultural field.



Brunswick-Kroeschell Carbonic Anhydride Compressor

Carbonic anhydride—or corbon dioxide as it is usually called—as a refrigerating medium has certain distinct advantages for the florist.

Freshly cut flowers are just like living organisms, they breathe the air surrounding them through their leaves and petals. In any refrigerating system in which gas is expanded directly into the cooling coils located in the refrigerators there is always a possibility of a slight leak developing in the coils or joints. When this occurs the refrigerator becomes filled with the refrigerating gas; if carbon dioxide is used no harmful results follow—there is no discoloration of the delicate petals of the flowers.

On the other hand it tends to preserve them rather than to cause decay. The reason for this is that all plant life must draw its supply of carbon from the carbon dioxide in the air. Without this plant life and vegetation of any kind could not exist. Carbonic anhydride is absolutely odorless. The small amount of this gas used in the average refrigeration plant could be liberated into the room without injurious effects or without one being aware of its presence.

Carbon dioxide gas is the same gas used in carbonated beverages and should never be confused with the poisonous carbon monoxide gas which so often produces tragic results. It is for these reasons that many florists prefer a carbonic anhydride plant. These characteristics cited above also adapt themselves to refrigeration plants installed in hospitals, hotels and theaters.

At 28 North Michigan Boulevard—in Chicago's congested loop district—is housed one of, if not the smallest, and most exquisite flower shops in the city. Though the very smallest of the chain of George Wienhoeber Inc. Stores it has the enviable distinction of having made under the efficient leadership of its manager, P. M. Miller, an outstanding financial success. This little shop has only a ten foot frontage and only fifty feet of display space! Another fifty feet is utilized for the cooling and the workrooms. In this small space they have always managed to be "on the right side of the ledger!"

The latest achievement of this company which is attracting nation wide attention was displayed in their window recently.

For eight years they have been experimenting in an effort to secure a specimen of the Sacred Black Lily of India. This is a floral rarity in North America. Officials of the company say that this lily never has been seen growing in this country and that the one on exhibition was obtained only after eight years of importing bulbs from India, in the effort to achieve a bloom. Since it takes eight years to develop a blossom from this plant is can readily be seen that these bulbs had only the most careful and technical care in order to produce an atmosphere corresponding to the one native to them; the correct temperature as well as just the proper amount of moisture had to be discovered and maintained. Only with electric refrigeration could this have been accomplished.

TRADE ASSOCIATIONS USEFUL TO BUSINESS

Affirming the usefulness of properly organized trade associations and the desirability of their adopting codes of ethics, Horace B. Lamb, Special Assistant to the Attorney General, has urged each industry to carefully study its proposed code to be sure that it is "based upon the facts of that indusry and will promote trade rather than restrict it under the guise of fostering better ethics."

In a recent interview with the press, Mr. Lamb pointed out the danger of the adoption by any industry of the code of ethics formulated by another. In one case, he said, this had been done without study of the conditions obtaining. It is better to adapt each code to the industry involved.

"Trade associations, if properly organized and living within the law, are useful to business," Mr. Lamb declared. "Probably if they are properly organized it will not be so necessary to have such big business units. Also, it will probably be less necessary to regulate.

Lawful Activities of a Trade Association

"The Supreme Court has listed five classes of subjects on which it is lawful for a trade association to give out information. They are as follows: 1. Cost of production. 2. Volume of production. 3. Actual price of a product bought in a past transaction. 4. Stocks on hand. 5. Cost of transportation.

"This permission is given provided the dissemination of the information does not take place in such a manner as to conflict with the anti-trust laws. The granting of these rights was a great boon to trade associations.

"The strongest tendency is to give out information about current or future prices. This is a thing which the courts have not yet held legal. In the maple flooring case, Mr. Justice Stone expressly found that there was no exchange of information in relation to current prices. That indicates that it is a practice that may be somewhat dangerous.

"There are four things which I believe determine the legitimacy of the trade association.

"First, a trade association should perform a service of intelligence. The Federal Trade Commission does not put a premium on ignorance of the facts that would affect the business of any industry.

"Further, there is a necessity that the trade association perform the service of intelligence where an industry does not have a market service which will supply that industry with the facts concerning it.

"Each separate unit engaged in an industry shall be absolutely unrestricted in its own judgment in relation to the conduct of its business and it shall have freedom of action.

"The public interest requires that a consumer or buyer shall have the benefit of free competition in regard to the price he shall pay, the quality of the goods he shall obtain, and all the other incidents of trading. It is a sort of insurance for the buyer.

"Finally," Mr. Lamb concluded, "no code of ethics will accomplish much without a willingness on the part of the members of the industry to follow it."—*Nema News.*

Boiling Point of Methyl Chloride Incorrectly Stated

In the listing of the boiling points of several refrigerants in an article entitled, "Environment More Vital Than Time in Keeping Foods," by S. Bennis, which appeared in the Feb. 13 issue, the boiling point of methyl chloride was given at 11°F. at atmospheric pressure. This should have read —11°F. at atmospheric pressure or to be more exact —10.65°F. at barometric pressure of 760 mm.

Modern Home Appliances Demonstrated at New York Exhibit

THE Home Making Center is a trade venture sponsored by the New York Federation of Women's Clubs, in which the manufacturer of home appliances and decorations and the woman consumer will co-operate. The Center will be opened Jan. 31 in the Grand Central Palace in New York City. It will attempt to rectify the condition of confusion which the trend leading to the always new in practicality has brought about for both the manufacturer and the housewife. The woman buyer can become acquainted with the right things to buy, so that she may be trained to do her own buying rather than just go into a store to be sold. The manufacturer, in turn, will have an opportunity to present his products directly to the potential customer.

Everything that goes into an ideally equipped home will be shown and demonstrated in a modern home, in exhibit space and in an auditorium which will seat 300 persons.

Food products approved by the Bureau of Home Economics will be on exhibition and lectures on all phases of food buying, preparing and serving will be given. A special demonstration in a typical kitchenette will feature the newer electrical appliances and the compact kitchen hardware.

Labor saving devices and conveniences employed will include many electrical appliances. This unit of the Home Making Center is being directly sponsored by the Electrical Women's Round Table. Every electrical appliance devised for use in the home will be demonstrated. As a family will actually live in this house and use all the articles in it, every product will have its own opportunity for effective demonstration.

Chemical Industries Exposition to be Held in New York, May 6-11

The Twelfth Exposition of Chemical Industries will be held during the week of May 6-11 at the Grand Central Palace, New York, N. Y. This exposition draws together representatives of forty industries.

Gets Order for 12 Frigidaires in Oregon Hotel

The new Burns hotel at Burns, Ore., will be equipped with 12 Frigidaire units. This order was closed by the Harney County Furniture Co.

DE LASHMUTT TO BE EASTERN MANAGER OF REFRIGERATION NEWS

C. G. Gray Appointed Circulation Manager

In order to give increased service to advertisers and agencies in the eastern territory, Harry A. De Lashmutt, advertising manager of ELECTRIC REFRIGERATION NEWS, will transfer his headquarters from Detroit to Philadelphia, where he will be eastern manager of the paper. An office of the Business News Publishing Company will be established in Philadelphia in the near future. (Friends of Mr. De Lashmutt will be interested to know that he was married to Miss Corinne Morrison Bell of Virginia, Saturday, February 23, at Pittsburgh, Pa.)

C. G. Gray, formerly manager of E. W. Husen Co., direct advertising specialists, Detroit, has been appointed circulation manager of the NEWS and will carry on an extensive campaign to develop the subscription list, particularly among local dealers and salesmen.

INDIAN MOTOCYCLE STOCKHOLDERS MEET

Loss for 1928 Due to Extensive Outlays for Experimental Work

A net loss of $419,029 was reported for the fiscal year ending Dec. 31, as against a profit of $25,322 for the preceding year, by the Indian Motocycle Co., Springfield, Mass., at its annual stockholders meeting which was held on Feb. 13. This loss it is stated is due in part to extensive outlays for experimental work, and to a change of accounting methods. The company, it is reported, expects to put its new electric refrigerator on the market in a short time.

At the annual meeting Louis E. Bauer and Claude Douthit were re-elected president and chairman of the board, respectively, and four directors, Charles A. Bauer, of Springfield, designing engineer for the company; Lindsey Hopkins of New York and Atlanta; J. G. Marshall and Henry A. Rudkin of New York were chosen.

INDUSTRIAL CONTROLLER AND SQUARE D MERGE

The consolidation of the Industrial Controller Co. of Milwaukee and the Square D Co. of Detroit has been approved by the two companies. According to present plans T. J. Kauffman is to head the consolidated company as president, Carlton M. Higbie, F. W. Magin and L. W. Mercer will be vice presidents and W. S. Worcester secretary and treasurer.

Both concerns in the merger manufacture electric switches, panel boards and other control devices and both are constructing additions to their properties to facilitate the handling of business.

WOLVERINE TUBE REPORTS EARNINGS $185,974. FOR '28

Net earnings of the Wolverine Tube Co., Detroit, for the year ended December 31, 1928, after all charges including depreciation, interest and federal taxes, amounting to $185,973.99. This was equal to $1.37 per share on the 114,695 shares of no-par common stock outstanding after preferred dividends. Balance sheet as of December 31, 1928 reveals current assets of $770,452 and current liabilities of $271,430. Total assets are $1,987,775.

CUTLER-HAMMER BUYS TRUMBULL VANDERPOEL

The Cutler-Hammer, Inc., Milwaukee, Wis., announces that it has acquired the business of the Trumbull Vanderpoel Electric Manufacturing Co., Bantam, Conn., which will be operated as a subsidiary under its present name. This adds a complete line of meter service and safety switches to the present Cutler-Hammer line of motor control, wiring devices and allied electrical devices.

ICE INDUSTRY ADOPTS STANDARD CAKE SIZES

The Commercial Standards Bureau of the Department of Commerce at Washington, D. C., announces that it has received signed acceptances from a sufficient number of manufacturers, distributors and users to insure the general adoption of the simplified practice recommendation for ice cake sizes. This recommendation limits the number of ice cake sizes to 25, 50, 100 and 150-lb. cakes as standard sizes for the industry.

Exports of Electric Refrigerators January-June, 1928

	Total,	January		February		March		April		May		June		Six Months		
		No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	
1	Austria	...	.....	220	43,202	...	.....	25	5,634	...	.....	69	15,111	314	63,947	1
2	Azores and Madeira Islands	...	.....	...	.....	3	540	...	.....	1	540	...	.....	4	1,080	2
3	Belgium	52	9,662	28	5,585	80	14,632	...	.....	148	27,682	16	3,540	324	61,101	3
4	Bulgaria	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	4
5	Czechoslovakia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	5
6	Denmark	11	1,401	48	10,969	16	3,234	48	10,593	82	11,567	32	5,875	237	43,639	6
7	Estonia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	7
8	Finland	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	8
9	France	35	6,751	2	1,109	3	1,570	9	1,708	54	9,511	40	8,344	143	28,993	9
10	Germany	81	19,515	11	2,168	78	13,893	44	7,506	72	14,023	41	10,017	327	67,122	10
11	Gibraltar	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	11
12	Greece	...	.....	...	.....	...	.....	...	.....	...	.....	6	550	6	550	12
13	Hungary	...	.....	16	3,235	10	1,905	22	5,626	...	.....	50	9,278	98	20,044	13
14	Iceland	...	.....	...	.....	6	1,230	...	.....	...	.....	...	.....	6	1,230	14
15	Irish Free State	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	15
16	Italy	21	7,309	...	.....	...	.....	2	253	88	14,710	6	1,059	117	23,331	16
17	Latvia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	17
18	Lithuania	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	18
19	Malta, Gozo, and Cyprus	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	19
20	Netherlands	5	1,564	34	6,315	42	8,669	43	8,285	125	25,081	19	3,755	268	53,669	20
21	Norway	...	.....	3	572	6	1,300	17	3,927	13	2,615	46	9,689	85	18,103	21
22	Poland and Danzig	...	.....	...	.....	...	.....	...	.....	...	.....	2	930	2	930	22
23	Portugal	3	540	...	.....	7	1,245	...	.....	15	3,113	...	.....	25	4,898	23
24	Rumania	...	.....	...	.....	...	.....	...	.....	...	.....	7	1,073	7	1,073	24
25	Soviet Russia In Europe	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	25
26	Spain	46	10,816	39	6,059	75	31,377	119	35,047	80	24,145	74	15,172	433	122,616	26
28	Sweden	8	2,104	2	445	25	7,352	...	.....	...	.....	14	2,661	49	12,562	28
29	Switzerland	66	10,659	3	685	5	847	29	4,473	70	11,196	20	4,953	193	32,813	29
30	Turkey in Europe	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	30
31	United Kingdom	20	1,900	60	8,756	99	18,656	126	32,278	473	41,829	651	87,660	1,429	191,079	31
32	Yugoslavia and Albania	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	32
33	Canada	78	25,185	320	75,037	823	156,114	2,252	327,116	2,402	377,814	2,522	368,538	8,397	1,329,804	33
34	British Honduras	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	34
35	Costa Rica	...	.....	3	1,239	...	.....	3	966	...	.....	2	715	8	2,920	35
36	Guatemala	3	799	3	1,001	4	1,584	...	.....	2	1,039	...	.....	12	4,423	36
37	Honduras	...	.....	1	511	...	.....	...	.....	1	146	...	.....	2	657	37
38	Nicaragua	1	180	6	1,120	...	.....	...	.....	...	.....	...	.....	7	1,300	38
39	Panama	13	3,279	1	314	4	1,428	7	3,023	15	6,813	11	3,620	51	18,477	39
41	Salvador	1	510	...	.....	4	896	2	597	15	3,705	4	647	26	6,355	41
42	Greenland	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	42
43	Mexico	28	4,700	11	3,624	50	8,265	35	10,208	54	15,672	28	10,257	206	52,726	43
45	Miquelon and St. Pierre Is.	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	45
46	Newfoundland and Labrador	...	.....	1	80	...	.....	...	.....	1	197	2	378	4	655	46
47	Bermudas	9	1,648	5	848	12	3,087	3	465	24	5,036	10	2,788	63	13,872	47
48	Barbados	3	820	4	740	2	860	...	.....	1	380	1	190	11	2,909	48
49	Jamaica	...	.....	...	.....	3	591	1	500	...	.....	1	218	5	1,309	49
50	Trinidad and Tobago	2	285	...	.....	...	.....	...	.....	...	.....	2	1,430	4	1,715	50
52	Other British West Indies	1	101	5	788	4	1,186	1	180	3	841	...	.....	14	3,096	52
53	Cuba	39	12,568	95	14,149	22	7,249	47	11,231	79	22,244	106	28,924	388	96,365	53
54	Dominican Republic	3	1,392	8	2,165	14	4,385	1	635	11	2,303	4	1,623	41	12,503	54
55	Dutch West Indies	2	305	2	360	...	.....	2	5,589	1	287	2	825	9	7,366	55
56	French West Indies	1	205	...	.....	1	195	...	.....	...	.....	...	.....	2	400	56
57	Haiti, Republic of	5	1,109	...	.....	3	405	4	973	6	1,111	...	.....	18	3,658	57
58	Virgin Islands of U. S.	...	.....	1	261	...	.....	4	735	...	.....	...	.....	5	996	58
60	Argentina	29	3,619	78	14,085	2	316	...	.....	34	4,179	112	27,788	255	49,987	60
61	Bolivia	...	.....	...	.....	...	.....	1	435	...	.....	...	.....	1	435	61
62	Brazil	192	35,577	135	27,549	93	15,135	121	29,334	28	6,302	34	6,137	603	120,034	62
65	Chile	2	687	1	167	15	2,900	...	.....	16	2,424	...	.....	34	6,178	65
66	Colombia	19	4,333	91	19,782	26	5,923	34	7,144	64	15,075	46	15,676	280	67,933	66
67	Ecuador	...	.....	1	280	...	.....	...	.....	3	512	9	2,008	13	2,800	67
68	Falkland Islands	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	68
69	British Guiana	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	69
70	Dutch Guiana	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	70
71	French Guiana	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	71
72	Paraguay	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	72
73	Peru	23	5,532	26	5,718	13	2,161	3	673	14	2,883	9	1,628	88	18,595	73
74	Uruguay	14	2,830	7	1,400	1	148	...	.....	...	.....	...	.....	22	4,378	74
75	Venezuela	38	8,186	50	10,860	13	3,063	12	2,466	10	2,486	21	4,274	144	31,335	75
76	Aden	...	.....	...	.....	...	.....	1	232	5	948	4	890	10	2,070	76
77	Arabia	...	.....	...	.....	...	.....	2	365	1	171	...	.....	3	536	77
78	British India	287	59,335	192	31,251	83	13,961	158	27,206	260	42,673	110	22,804	1,090	197,230	78
79	British Malaya	12	2,488	8	1,991	23	3,046	1	565	11	1,898	...	.....	55	9,988	79
80	Ceylon	21	2,841	11	2,247	...	.....	...	.....	3	662	2	312	37	6,062	80
81	China	...	.....	3	558	98	14,801	6	2,570	102	21,095	69	11,103	278	50,127	81
82	Java and Madura	10	2,313	25	5,553	8	2,821	7	1,500	...	.....	4	700	54	12,887	82
83	Other Dutch East Indies	...	.....	2	277	...	.....	...	.....	...	.....	...	.....	2	277	83
84	French Indo-China	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	84
85	Hong Kong	1	205	21	4,211	1	526	3	617	29	6,188	8	2,070	63	13,817	85
86	Iraq	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	86
87	Japan	2	351	6	2,067	83	17,230	6	1,842	8	2,151	29	6,711	134	30,352	87
88	Kwantung	...	.....	...	.....	16	4,648	...	.....	...	.....	...	.....	16	4,648	88
89	Palestine	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	89
90	Persia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	90
93	Philippine Islands	1	174	65	12,870	18	3,911	96	19,402	56	12,667	4	1,428	240	50,452	93
96	Siam	...	.....	12	3,476	...	.....	...	.....	...	.....	...	.....	12	3,476	96
97	Soviet Russia in Asia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	97
98	Syria	...	.....	...	.....	2	380	1	365	1	100	6	1,150	10	1,995	98
99	Turkey in Asia	...	.....	...	.....	3	371	...	.....	9	1,377	...	.....	12	1,748	99
100	Other Asia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	100
101	Australia	65	17,487	62	12,675	68	14,986	53	8,402	66	13,113	132	21,404	446	88,067	101
102	British Oceania	...	.....	1	259	2	738	...	.....	...	.....	...	.....	3	997	102
103	French Oceania	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	103
104	New Zealand	1	162	14	3,016	6	1,337	4	613	16	4,543	45	7,838	86	17,509	104
105	Ethiopia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	105
106	Belgian Congo	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	106
107	British East Africa	...	.....	...	.....	4	841	4	963	24	3,446	3	672	35	5,922	107
109	Union of South Africa	64	19,275	24	7,174	42	14,088	19	5,994	31	6,454	14	4,854	194	57,839	109
110	Other British South Africa	...	.....	27	4,830	...	.....	...	.....	...	.....	...	.....	27	4,830	110
111	British West Africa	5	960	3	351	6	1,070	2	250	...	.....	...	.....	16	2,631	111
112	Egypt	23	3,182	26	4,529	...	.....	25	4,734	29	5,927	24	5,187	127	23,559	112
113	Algeria and Tunisia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	113
115	Madagascar	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	115
116	Other French Africa	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	116
117	Italian Africa	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	117
118	Liberia	...	.....	...	.....	1	211	...	.....	...	.....	...	.....	1	211	118
119	Morocco	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	.....	.....	119
120	Mozambique	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	120
121	Other Portuguese Africa	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	121
122	Canary Islands	...	.....	...	.....	...	.....	...	.....	4	904	...	.....	4	904	122
123	Other Spanish Africa	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	....	.....	123
		1,346	$294,844	1,823	$368,513	2,028	$417,307	3,405	$593,220	4,660	$781,838	4,473	$744,454	17,735	$3,200,176	

STERLING ELECTRIC CO. NAMED KELVINATOR DISTRIBUTOR

The Sterling Electric Co., Minneapolis, Minn., was recently appointed distributor for Kelvinator, covering that part of the territory not now covered by the Northern States Power Co., according to H. A. Dahl, northwestern Kelvinator representative.

The Sterling Electric Co. has been in the electrical jobbing business for thirty-five years. They are located in the heart of the Minneapolis retail district and have an attractive display floor.

Personnel of the company is W. E. Stephenson, president; John Helm, vice president; E. A. Lindquist, general manager, and Jack Loomis, manager of the Kelvinator department.

ELECTRIC COOLING AIDS SALES OF OMAHA FLORIST

The Faulkner Flower Shop, Forty-third and Leavenworth, Omaha, Nebr., is now supplied with electric refrigeration. Mr. Faulkner has a refrigerator that formerly ate up around 250 pounds of ice each day. He found this expensive, discommoding, and dirty. Frequently just at the time the ice man was filling the box a good customer would be waiting. The surroundings rather deterred the purchaser.

To cure all these evils Mr. Faulkner had an LB Kelvinator compressor installed. A ¾ h. p. motor furnishes the power. No trouble is experienced in keeping the box at the right temperature.

Some of the reasons Mr. Faulkner gave in favor of the electric refrigeration for the florist were: It is clean, dependable and saves flowers and thus increases profits. Sales are larger because the surroundings are improved and the customer dwells longer amidst the fragrance and pleasant atmosphere; this means larger orders. All these things tend to give greater satisfaction and in that way promote harmony and good will.

REFUSES TO GO TO ICE PLANT FOR HIS LUNCH

The terms "ice box" and "refrigerator" seem still to be causing argument. "Ice plant," says a reader of Time, is going too strong, however. In the column of "Letters" in the Jan. 28 issue of that magazine, an objection is raised to the statement used in a previous article which read, "Balancing General Motors, Chrysler has everything except an Ice Box."

The objector says, "On several occasions you have either ignorantly, or 'accidentally on purpose' put the wrong words in the wrong place. Of all the times Time has done this, the issue of Jan. 7 contains one of the 'aops'—that is, a word, or words, used accidentally on purpose or ignorantly, and that word is 'Ice Box'."

"The words 'Ice Box' used in this case are an 'aop' of high magnitude. General Motors are spending millions yearly educating the people of the United States and almost all other countries in the world away from using any kind of ice box to their method of refrigeration. You could have called it an 'ice plant' as it makes ice, but please don't call General Motors ice box manufacturers, because people with very little knowledge of General Motors know they do not make ice boxes. You woldn't say Ford made buggies; it is as absurd to say that General Motors makes ice boxes."

The letter, however, went a little far thought one Time reader. He answers in the Feb. 11 issue, saying, "The Frigidaire in our kitchen may not be an ice box, but I'll be darned if I am going out to the 'ice plant' to get a bite to eat before I go to bed tonight."

G. B. Baskerville Appointed Baker Sales Representative in South

The Baker Ice Machine Co., Omaha, Nebr., announces the appointment of George B. Baskerville, 1116 Martin Bldg., Birmingham, Ala., as its sales representative in that territory. He will handle Baker equipment in Alabama and that portion of Florida west of the Chattahoochee River.

Mr. Baskerville's experience in refrigeration dates back prior to 1915, when he operated a plant at Louisville, Miss. Later he owned a 10-ton ice plant and has acted as chief and consulting engineer for some of the large manufacturing and public utility companies in the Southeast.

Exports of Electric Refrigerators July-December, 1928

		July		August		September		October		November		December		Grand Totals Year 1928		
		No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	
1	Austria	106	20,800	211	41,969	...	.....	...	.....	1	124	1	338	633	127,178	1
2	Azores and Madeira Islands	5	1,010	...	.....	...	.....	1	375	...	.....	...	.....	10	2,465	2
3	Belgium	42	8,348	57	11,961	...	.....	1	103	36	7,788	67	12,677	527	101,978	3
4	Bulgaria	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	4
5	Czechoslovakia	...	.....	36	7,545	...	.....	...	.....	...	.....	1	295	37	7,840	5
6	Denmark	27	5,918	21	5,286	7	1,754	2	428	4	1,020	...	.....	298	58,045	6
7	Estonia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	7
8	Finland	45	8,546	...	.....	30	3,170	17	3,200	14	3,361	1	200	107	18,477	8
9	France	14	1,773	29	4,464	38	7,090	18	4,252	4	874	52	9,487	298	56,933	9
10	Germany	47	9,426	71	11,115	14	1,860	59	9,770	95	17,781	2	783	615	117,857	10
11	Gibraltar	...	.....	...	.....	...	.....	...	.....	1	362	1	225	2	587	11
12	Greece	...	.....	7	1,531	...	.....	...	.....	...	.....	...	.....	13	2,081	12
13	Hungary	...	.....	...	.....	5	1,073	...	.....	...	.....	...	.....	103	21,117	13
14	Iceland	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	6	1,230	14
15	Irish Free State	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	15
16	Italy	65	19,549	93	21,418	...	.....	50	9,500	...	.....	45	8,721	370	82,519	16
17	Latvia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	17
18	Lithuania	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	18
19	Malta, Gozo and Cyprus	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	19
20	Netherlands	34	6,396	108	6,925	12	2,342	5	940	12	2,062	24	3,830	463	76,164	20
21	Norway	...	.....	7	1,483	5	718	4	821	10	1,989	15	2,850	126	25,964	21
22	Poland and Danzig	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	2	930	22
23	Portugal	18	3,985	5	1,903	...	.....	...	.....	6	1,237	3	739	57	12,762	23
24	Rumania	1	177	2	540	...	.....	...	.....	1	200	2	542	13	2,532	24
25	Soviet Russia in Europe	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	25
26	Spain	103	30,940	41	9,166	46	10,046	23	7,581	35	7,454	133	23,656	814	211,459	26
28	Sweden	81	15,965	26	7,330	44	6,311	...	.....	...	.....	48	10,108	248	52,276	28
29	Switzerland	52	7,898	24	4,106	...	.....	12	1,383	10	1,592	11	2,278	302	50,070	29
31	United Kingdom	48	7,240	42	6,154	15	2,402	14	2,628	19	2,690	13	2,104	1,580	214,297	31
32	Yugoslavia and Albania	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	32
33	Canada	1,493	206,342	629	105,202	1,158	178,981	890	148,195	804	140,937	224	47,854	13,595	2,157,315	33
34	British Honduras	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	34
35	Costa Rica	3	562	...	.....	4	1,693	13	2,397	3	901	9	2,378	40	10,851	35
36	Guatemala	1	364	2	676	...	.....	6	1,075	1	541	...	.....	22	7,079	36
37	Honduras	7	648	4	754	1	281	...	.....	2	830	5	884	21	4,054	37
38	Nicaragua	1	315	...	.....	1	190	...	.....	3	507	1	130	13	2,442	38
39	Panama	33	8,117	23	5,608	13	3,550	4	963	34	7,731	24	5,894	182	50,340	39
41	Salvador	...	.....	11	4,175	4	1,296	10	1,781	6	2,575	16	3,912	73	20,094	41
42	Greenland	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	42
43	Mexico	44	13,083	53	12,125	11	2,258	62	12,985	99	17,522	74	18,129	549	128,828	43
45	Miquelon and St. Pierre Is.	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	45
46	Newfoundland and Labrador	...	.....	4	624	...	.....	...	.....	...	.....	...	.....	8	1,279	46
47	Bermudas	16	3,219	31	7,198	3	444	19	3,894	18	4,875	10	1,756	160	35,258	47
48	Barbados	...	.....	1	190	...	.....	3	585	4	839	...	.....	19	4,604	48
49	Jamaica	1	487	10	596	...	.....	...	.....	3	338	2	972	21	3,702	49
50	Trinidad and Tobago	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	4	1,715	50
52	Other British West Indies	3	835	2	537	8	2,115	3	787	10	1,956	3	400	43	9,726	52
53	Cuba	80	8,098	26	6,324	144	26,036	34	10,099	64	10,821	137	27,309	873	185,052	53
54	Dominican Republic	16	4,476	12	2,653	44	8,942	70	12,918	8	3,447	5	1,956	196	46,895	54
55	Netherland West Indies	1	423	...	.....	...	.....	1	405	1	925	1	350	13	9,469	55
56	French West Indies	...	.....	1	452	...	.....	1	225	...	.....	...	.....	4	1,077	56
57	Haiti, Republic of	...	.....	7	1,350	...	.....	...	.....	2	373	4	1,287	31	6,668	57
58	Virgin Islands of U. S.	...	.....	...	.....	...	.....	...	.....	...	.....	2	756	7	1,752	58
60	Argentina	98	21,283	18	14,924	191	21,311	60	12,623	719	102,369	292	36,087	1,633	258,584	60
61	Bolivia	7	1,500	...	.....	...	.....	...	.....	1	195	...	.....	9	2,130	61
62	Brazil	268	45,784	26	6,069	98	22,154	191	41,215	419	78,437	122	17,430	1,727	331,123	62
65	Chile	1	221	17	2,680	14	2,747	13	2,413	22	1,683	25	6,206	126	22,128	65
66	Colombia	42	9,284	29	5,856	134	28,770	62	13,953	61	12,866	65	12,363	673	151,025	66
67	Ecuador	2	325	...	.....	...	.....	6	987	12	1,974	...	.....	33	6,086	67
68	Falkland Islands	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	68
69	British Guiana	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	69
70	Surinam	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	70
71	French Guiana	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	71
72	Paraguay	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	72
73	Peru	11	2,428	6	1,916	3	1,038	...	.....	4	1,092	18	3,873	130	28,942	73
74	Uruguay	...	.....	17	4,699	20	4,034	79	15,351	92	18,741	161	30,135	391	77,338	74
75	Venezuela	35	7,580	34	6,277	4	720	7	1,503	51	10,675	47	9,342	322	67,432	75
76	Aden	2	471	3	528	...	.....	...	.....	1	220	2	406	18	3,695	76
77	Arabia	2	203	...	.....	...	.....	1	200	...	.....	...	.....	6	939	77
78	British India	107	19,819	43	7,915	43	8,437	15	3,096	274	17,778	180	26,711	1,752	280,986	78
79	British Malaya	1	182	4	770	9	2,282	2	767	3	839	9	1,797	83	16,625	79
80	Ceylon	1	283	...	.....	10	1,923	6	672	...	.....	...	.....	54	8,940	80
81	China	14	3,219	17	4,280	9	1,257	38	12,357	34	9,046	91	3,908	481	84,194	81
82	Java and Madura	14	2,155	10	2,322	4	728	...	.....	1	62	28	5,482	111	23,636	82
83	Other Netherland East Indies	...	.....	...	.....	...	.....	...	.....	...	.....	3	571	5	848	83
84	French Indo-China	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	84
85	Hong Kong	7	925	13	3,093	3	1,167	3	590	15	2,505	2	498	106	22,595	85
86	Iraq	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	86
87	Japan	3	853	2	369	16	5,255	...	.....	1	409	7	1,664	163	38,902	87
88	Kwantung	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	16	4,648	88
89	Palestine	1	250	...	.....	...	.....	...	.....	...	.....	1	250	2	500	89
90	Persia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	90
93	Philippine Islands	47	9,294	11	2,772	17	3,224	29	7,341	86	13,722	29	5,234	459	92,039	93
96	Siam	6	959	17	2,711	1	813	...	.....	...	.....	...	.....	36	7,959	96
97	Soviet Russia in Asia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	97
98	Syria	...	.....	1	297	...	.....	...	.....	...	.....	...	.....	11	2,292	98
99	Turkey	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	12	1,748	99
100	Other Asia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	100
101	Australia	153	36,640	294	50,488	339	74,155	330	60,122	904	242,185	934	141,340	3,400	692,997	101
102	British Oceania	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	3	997	102
103	French Oceania	...	.....	...	.....	4	520	...	.....	...	.....	...	.....	4	520	103
104	New Zealand	10	3,792	5	1,104	14	2,899	19	3,251	21	3,603	64	11,308	219	43,466	104
105	Ethiopia	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	105
106	Belgian Congo	...	.....	...	.....	...	.....	...	.....	1	47	...	.....	1	47	106
107	British East Africa	...	.....	2	476	1	271	12	2,270	4	1,071	6	828	60	10,838	107
109	Union of South Africa	43	11,283	23	5,549	88	18,141	91	24,393	172	32,490	250	46,555	861	196,250	109
110	Other British South Africa	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	27	4,830	110
111	British West Africa	...	.....	...	.....	...	.....	22	2,986	7	1,157	26	3,525	71	10,299	111
112	Egypt	2	497	10	2,370	7	1,596	1	146	11	2,383	12	2,654	170	33,205	112
113	Algeria and Tunisia	11	1,240	...	.....	3	585	...	.....	...	.....	...	.....	14	1,825	113
115	Madagascar	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	115
116	Other French Africa	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	116
117	Italian Africa	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	...	.....	117
118	Liberia	...	.....	...	.....	...	.....	2	430	...	.....	...	.....	3	641	118
119	Morocco	...	.....	2	335	...	.....	3	984	...	.....	3	803	8	2,122	119
120	Mozambique	...	.....	...	.....	6	934	...	.....	...	.....	...	.....	6	934	120
121	Other Portuguese Africa	1	105	...	.....	...	.....	...	.....	1	377	...	.....	2	482	121
122	Canary Islands	...	.....	...	.....	...	.....	...	.....	1	294	...	.....	5	1,198	122
123	Other Spanish Africa	1	233	...	.....	...	.....	...	.....	...	.....	...	.....	1	233	123
	TOTAL	3,277	$575,748	2,200	$419,160	2,645	$467,513	2,314	$444,940	4,228	$799,872	3,313	$561,770	35,712	$6,469,179	

Above figures reported by U. S. Department of Commerce.

SUGGESTS SEPARATE LOW PRESSURE CUT-OUT AND RELAY WITH BRINE PUMP

Points Out that All Troubles Are Not Electrical

NOTE—In the Feb. 13 issue of the NEWS on page 9, H. P. Greggerson, Kelvinator service manager of the Northwestern Public Service Company, Huron, S. D., suggested a hookup, using an automatic cut-in relay, for protecting refrigeration systems using a brine pump. Copies of Mr. Greggerson's letter were sent to several manufacturers with the request that they offer their opinions. The following letter was received from the Brunswick-Kroeschell Co.—Editor.

BRUNSWICK-KROESCHELL COMPANY
New Brunswick, N. J.,
February 12, 1929

Electric Refrigeration News,
Detroit, Michigan.

In reference to Mr. Greggersen's letter attached to yours of the 6th instant, we wish to comment as follows:

The idea of supplying the current for the low-voltage relays of the compressor motor circuit from the load side of the circuit fuses for the circulating brine pump or water pump, is a commendable one. Whenever the compressor is dependent upon a circulating pump the electricians installing an automatic plant should be instructed to make their connections in this way.

But,—many common troubles with circulating pumps are not electrical and would not cause the pump fuses to blow. For instance, in case of loss of suction, or stoppage in suction line to pump, there would be no circulation and compressor motor would continue to operate with connections as described above, since no fuses would blow. Therefore, every automatic plant depending upon a circulating pump should be equipped with a separate low-pressure cut-out switch and relay which will prevent the compressor motor from starting or running unless the pump is operating and is maintaining pressure on the circulating piping. This relay should be independent of the customary low-voltage, overload, thermostat and high-pressure cut-out relays.

S. B. CARPENDER,
Vice-President.

FRIGIDAIRE MAKES STUDY OF VARIETIES OF FRAME WOODS

E. N. James, head of manufacturing estimates of the Frigidaire Corp., Dayton; C. F. Rowe, manager of the frame fabrication department, and Grant Fink, manager of the Seattle branch of Frigidaire, studied Douglas fir, West Coast spruce, and other northwest wood at the Long-Bell Lumber Co., Longview, Calif., in January, to consider the possibility of securing their raw material from this plant.

Frames for 100,000 cabinets were recently cut out at the Long-Bell plant and shipped to Dayton, and a strong possibility was said to exist that the corporation may fill all its wood requirements at the northwest mill.